Policy Development Guidebook

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Intel Support for ICT Policy Development

Overview

ICT-based innovation can happen in the classroom without an ICT policy\(^1\). There are many cases around the world where motivated, skilled teachers have used the power of ICT to engage students in collaborative research, searching and managing information, and creating and publishing digital products.\(^2\) However, it is policy that can connect ICT-based innovation to other changes in curriculum and assessment; to professional development, teaching and learning; and to research and evaluation that can transform the entire educational system. In this context, Intel seeks to support ICT policy and educational transformation by providing government agencies with an extensive and extensible set of policy development tools.

The Policy Development Guidebook consists of materials organized around the four-phased model of the policy development process, as described in the Educational Policy Brief, written by Dr. Robert Kozma\(^3\) and available for distribution at www.intel.com. The four phases in this model are: Envision the future, develop a master plan, implement initiatives, and evaluate and adapt. These steps are further elaborated to provide materials that policy makers can use to help them develop their skills and their policies. These materials address the five components of education transformation: policy, curriculum and assessment, professional development, ICT and research and evaluation. The policy development materials are sets of documents (exercises, readings, video clips, case studies, bibliographies, and other resources) designed for policymakers, legislators, ministry officials, administrators, and education leaders at the national, state, or municipal level.

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Intel Support for ICT Policy Development

Phase: Envisioning the Future

The Intel Policy Development Guidebook consists of materials organized around the four-phased model of the policy development process: Envision the future, develop a master plan, implement initiatives, and evaluate and adapt. The materials for the Envisioning Phase consist of three steps: Creating a long term vision, defining stakeholders’ mission, and analyzing the socio-ecosystem.

Goal
The materials for the Envisioning Phase are designed to help you create a long-term vision; identify key stakeholders and analyze their missions to help you create a shared vision; and analyze the current situation so that you know from where you are starting.

Resources
Each step includes a set of online documents (exercises, readings, video clips, case studies, bibliographies, and other resources) that will help you create usable outputs and achieve your goals.

Output
At the end of the Envisioning Phase, you will have:

- a well-articulated vision of what your education system will look like and the role that ICT will play in creating that vision;
- a set of identified stakeholders, within and outside the government, who will need to share this vision. You will also identify their missions so that you know how they can help move toward the vision.
- an analysis of the current, socio-ecosystem so that you know your starting point, the strengths and weaknesses of the current system.
Phase: Envisioning the Future

Step: Creating a Shared Vision

Envisioning Exercise

Goal
The goal of this exercise is to help you think about the future of your country, province, or municipality: where it is you would like it to go, what it might look like and how education fits into that vision. Such visions guide policy and program development and assure that they are coherent and contribute to the desired direction for the country. Often these visions are enabled by ICT.

Your country may already have an articulated national vision that specifies directions and goals for the future in areas such as economic development, telecommunications, education, social programs, and health. Your country may also have a more-specific vision for the future of education, enabled by ICT. These are good starting points. The goal of this exercise is to begin with these visions and take them to the next step, to sharpen the vision of education in the future: what will be taught and learned, how it will be assessed, what teachers and students will do, how schools will be organized, and how ICT will be used.

Resources
In addition to this exercise, you have access to a list of national visions (including those for Jordan and Singapore) and a set of video clips of innovative schools that may serve to help you think about what your schools might look like in the future.

Outcomes
As a result of this exercise, you will have an articulated vision of what schools will be like in the future and how technology will enable that vision.

National Vision
If your country has a national vision, please summarize it here:

If your country has an education vision, please summarize it here:
If your country does not have a vision, this is an opportunity for you to think about and create one. Review the visions of various countries in the accompanying collection of visions. Whether you are working in a group or working alone, take the opportunity to discuss these with your colleagues. Often envisioning is an extended process of creating a shared vision. But for the moment, set out your vision for what you would like education in your country to look like in the future:

How does this education vision contribute to a grander vision of economic and social development in your country?

**Sharpening the Education Vision**

Vision statements are often high-sounding but general and ambiguous. Sometimes this is intentional, so as to create more agreement and buy-in. But the realization of a vision requires programs and initiatives that will move the country forward. This, in turn, requires more specification of the vision. That is the purpose of this part of the exercise, to take the general vision statement above and turn it into a more-focused picture of what classrooms and schools might look like in a future enriched by technology.

Sometimes we need help envisioning the future, especially in education where school today look pretty much as they did one hundred years ago. The attached list of “Vision Videos” is meant to help you break out of the box. Either in small groups or working alone, select two of the videos and view them. If you are in a group, select one of the themes below and work with your group to create your own image of a future education system from the perspective of professional development, pedagogy, curriculum, assessment, or school organization and management. If you are working alone, respond to each of these, sharpening your education vision.

When you have completed this part of the exercise, answer the questions below. If you are working in groups, come back together as a group-of-the-whole, share your responses to each of the themes, see if you come up with a shared vision, and then respond to the questions below.

Summarize here your sharpened vision, based on your responses to the individual themes:
How do the various components work together to reinforce and support each other?

How does ICT support this vision?

How does this vision of education advance to more-general national vision for economic and social development?
School Policy, Organization and Management

Look ahead 15 years into the future. What will education in your country look like infused with technology? Here, we would like you to focus on school policy, organization and management. Think quite broadly but among your thoughts include these questions:

Where will learning take place? Will school buildings look different?

Will classrooms look different? Will there even be classrooms?

Will there be age-based grades?

When will learning occur? Will the school day or school year be scheduled differently?

Will teachers interact with each other and with principals differently?

What decisions will be made by principals, teachers, or even students and which made by the MOE or Directorate?

What information will be needed to make these decisions?

How will ICT support these changes? What ICT resources will be needed?
Curriculum and Assessment

Look forward 15 years into the future. What will education in your country look like infused with technology? Here, we would like you to focus on curriculum and assessment. Think quite broadly but among your thoughts include these questions:

What kinds of knowledge and skills will students learn?

How will the curriculum be organized?

Who will decide what students learn?

Will school subjects still be important? If so, how will they connect with “soft skills”, such as collaboration, communication, and complex problem solving?

How will student learning be measured? What will assessments look like?

How often will students be assessed?
Who will determine the quality of student work?

Where will information on student learning be stored?

Who will have access to it?

What will be done with this information?

How will ICT support these changes? What ICT resources will be needed?
Professional Development, Teaching and Learning

Look ahead 15 years into the future. What will education in your country look like infused with technology? Here, we would like you to focus on pedagogy. Think quite broadly but among your thoughts include these questions:

What kinds of things will happen during learning?

What will students be doing? What will be the student’s role?

What will teachers be doing? What will be the teacher’s role?

What role do parents and the community play?

What about other human resources, such as business people, scientists, and other experts?

What kind of technology and digital learning resources will students have? Who will create these? How will students access and use them?

How will ICT support these changes? What ICT resources will be needed?
Research and Evaluation

Look forward 15 years into the future. What will education in your country look like infused with technology? Here, we would like you to focus on research and evaluation. Think quite broadly but among your thoughts include these questions:

What information will be used to make education improvement decisions? Who will be involved in making decisions?

Where will this information come from? How often will it be collected?

Who will be involved in research and evaluation?

How will ICT support these changes? What ICT resources will be needed?
Phase: Envisioning the Future

Step: Creating a Shared Vision

Vision Videos

Below are a set of schools and educational programs in the United States where curriculum and assessment, teaching and learning, and school organization are being redefined. ICT is enabling these changes. These videos can help you come up with ideas for visions of how schools might look in the future in your country. As you view them, notice:

- what is taught and how it is assessed
- the practices of teachers
- the activities of students
- where learning occurs
- who is involved in teaching and learning
- how teachers, students, and others interact and share knowledge
- how ICT supports learning

In-Depth Case Studies

High Tech High, San Diego, California

Team teaching

http://www.edutopia.org/high-tech-high-team-teaching-video

Connecting with the outside world

http://www.edutopia.org/high-tech-high-team-teaching-video

Role of ICT

http://www.edutopia.org/projects-portfolio-assessments
Ferryway School, Malden, Massachusetts

Integrated curriculum

http://www.edutopia.org/integrated-studies-overview-video

Role of ICT

http://www.edutopia.org/ferryway-ironworks-integrated-studies-video

Build San Francisco, San Francisco, California

Connecting with the outside world

http://www.edutopia.org/build-sf-learning-design-civic-education-video

Assessment

http://www.edutopia.org/build-sf-assessment-video

Aviation High School, Seattle, Washington

Connecting to the outside world

http://www.edutopia.org/engineering-success-aviation-pbl-video

Designing a multi-disciplinary project

http://www.youtube.com/biepbl#p/c/3AA6ADD734414F11/8/CB9ffc5YFXE

Collaborative projects

http://www.youtube.com/biepbl#p/c/3AA6ADD734414F11/12/pBWd8JMwmRU

Assessment of 21st century skills

http://www.youtube.com/biepbl#p/c/3AA6ADD734414F11/10/Wft1rGsj0

High Tech High, Napa, California

Developing 21st Century skills

http://www.youtube.com/biepbl#p/c/8EAE0FBB6693F00E/11/YjKpD7qh7Ac

Assessing 21st Century skills

http://www.youtube.com/biepbl#p/c/3AA6ADD734414F11/7/n2WKCBxex0U
Other Interesting Case Studies
Boston Arts Academy, Boston, Massachusetts
http://www.edutopia.org/build-sf-learning-design-civic-education-video

King Middle School, Portland, Maine
http://www.edutopia.org/king-middle-school-expeditionary-learning-video

Biotech Academy, Andrew Hill High School, San Jose, California
http://www.edutopia.org/biotech-academy-school-career-video

School of Environmental Studies, Apple Valley, Minnesota
http://www.edutopia.org/school-environmental-studies-project-learning-video

Minnesota New Country School, Henderson, Minnesota
http://www.youtube.com/biepbl#p/c/8EAE0FBB6693F00E/3/ovkW8M8vD5o

School of Digital Media and Design, San Diego
http://www.youtube.com/biepbl#p/c/3AA6ADD734414F11/0/9VzhStQwQSI

Project-Based Learning Around the World
Singapore
http://www.youtube.com/biepbl#p/c/A2479A72F70546A6/2/8VTuLobed60

China
http://www.youtube.com/biepbl#p/c/A2479A72F70546A6/6/OchlZqoMI_M

Canada
http://www.youtube.com/biepbl#p/c/3AA6ADD734414F11/5/D84sJwKVwoE

England
http://www.youtube.com/watch?v=a63XApw4gwM
Additional Resources
George Lucas Education Foundation: http://www.edutopia.org/video

Buck Institute for Education: http://www.bie.org/

EdVisions Schools: http://www.edvisions.com/

Pearson Foundation: http://pearsonfoundation.org/oecd/
Phase: Envisioning the Future

Step: Creating a Shared Vision

Collection of National Visions

Cambodia
In Cambodia, the vision is part of the Education for All National Plan (2003-2015):

“The long term-vision of Education for All in Cambodia is to ensure equal access to quality basic education for all citizens and to prepare its citizens to play an active role in reconstructing the country as well as integrating Cambodia to the knowledge-based global community. The Ministry of Education, Youth and Sport (MoEYS) is introducing various initiatives to facilitate greater integration of information and communication technology (ICT) to improve the effectiveness of education at all levels and to produce the technologically literate, productive and critically thinking workforce for the country.”


Canada (Alberta)
In Canada, education policy devolves to the provinces. This is the ICT policy vision for the province of Alberta:

“Information and communication technology supports Alberta’s globally recognized learning community by enhancing learning delivery, knowledge and skill acquisition, learning system management, and innovation.”

http://education.alberta.ca/media/822425/landtpolicyframework.pdf

Finland
Finland’s vision, as articulated by the Government Resolution on the Objectives of the National Information Society Policy for 2008-2011 states that by 2015:

“Finland is an internationally recognized, competitive, competence-based service society with a human touch. In the increasing global competition it has been successful in providing individuals and organisations with opportunities for a good life by developing competencies,
know-how and creativity and by adopting substantial reforms in structures and operating models.

A strong national vision and state of will, and investments in the information society development have led into a positive circle that has brought Finland from producing and exploiting information and communications technology to generating growth as one of the global forerunners. Finnish businesses and public sector are among the international leaders in utilizing information and communications technology and making use of the new, global business opportunities provided by the information society development.

The Finnish information society is based on balanced social and regional information society development; a compatible, information-secure and accessible information society infrastructure; and great trust in the involved actors and services. The information society is flexible and user-oriented in all everyday situations.

Finland has transformed into a knowledge-based service society in a way that improves businesses’ competitiveness, provides high-quality services in public and private sectors, and promotes the well-being of society and individuals. This has called for significant changes in service provision, innovation systems and work life.”


Hong Kong
In Hong Kong, the vision of schools and classrooms of tomorrow is:

“Students, teachers, schools and other stakeholders will use IT effectively as a tool for enhancing the effectiveness of learning and teaching, with a view to preparing our students for the information age, turning schools into dynamic and interactive learning institutions, and fostering collaboration among schools, parents, and community.”


India
India’s education vision is linked to the Government’s economic development goals:

“Education system is in continuous alignment to her economic-GDP 2020 vision of 44% of national GDP from agricultural income, 21% of GDP from manufacturing sector and 35% of GDP from the services sector.”

http://www.csdms.in/gesci/ict-policy-everonn_%20paper_susha.asp
Japan
In Japan the Ministry of Education, Culture, Sports, Science and Technology (MEXT), is coordinating a set of “Information Society” policies to ‘informatize’ education, science, technology, sports, and culture:

“Taking into account the development of broadband Internet services and other remarkable developments in information and communications technology in recent years, MEXT, in line the ‘e-Japan Strategy’ which aims to make Japan the most advanced IT nation in the world by 2005, is actively formulating a variety of policies to promote informatization in education, science and technology, sports and culture.

In school education, MEXT is implementing information education in order to cultivate the information literacy which is an important element of the ‘zest for living’ of children and is promoting the effective utilization of IT in all school subjects in order to realize ‘Easy-to-understand lessons’. MEXT is also promoting measures with the full cooperation of the public and private sectors such as development of intra-school networks in ordinary classrooms and promotion of the improvement of instruction ability utilizing IT.”


Jordan
Jordan’s vision was articulated by King Abdallah and linked education reform to economic development such that in the future:

“The Hashemite Kingdom of Jordan has the quality competitive human resource systems that provide all people with lifelong learning experiences relevant to their current and future needs in order to respond to and stimulate sustained economic development through an educated population and a skilled workforce.”


Namibia
Namibia’s National Plan, Vision 2030, states:

“Vision 2030 will transform Namibia into a healthy and food-secure nation, in which all preventable, infectious and parasitic disease (including HIV/AIDS) are under secure control; people enjoy high standards of living, a good quality life and have access to quality education, health and other vital services. All of these aspirations translate into a long life expectancy and sustainable population growth.”

http://www.tech.na/vision2030.htm
Tech/NA! is the Education Ministry’s ICT component of the larger education improvement program in support of Vision 2030, which has as its vision:

“The Ministry of Education has undertaken a sector improvement programme, the Education and Training Sector Improvement Programme (ETSIP), to increase the efficiency of the education and training system. ETSIP aims to increase the number of skilled and employable Namibians through a strong focus on improving educational quality.”

http://www.tech.na/initiative.htm

**Netherlands**
The Netherlands has a decentralized approach to policy in which they encourage individual schools to develop their ICT vision:

“In primary education almost three-quarters of all schools have developed a vision on the use of ICT centrally. In secondary education six out of ten schools have an explicit vision on ICT.

To a considerable extent, the attitudes within a school towards the structuring and organization of learning processes determines which ICT application will or will not tie in with the educational objectives. The ICT yield is related to the match between educational vision and choice of ICT. A mismatch between educational vision and ICT application means, in practice, that teachers use educational materials not developed for the learning situation in which they are deployed.”


**Portugal**
Portugal’s Technological Plan for Education states:

“The vision defined and shared by the agents in the educational community is clear: to place Portugal among the five most advanced European countries in terms of technological modernisation of education.”


**Rwanda**
The education vision of Rwanda is built on a national economic vision, called Vision 2020, which states:

“Given that the major aspiration of Vision 2020 is to transform Rwanda’s economy into a middle income country (per capita income of about 900 USD per year, from 290 USD today), this will require an annual growth rate of at least 7%. This will not be achieved unless we
transform from a subsistence agriculture economy to a knowledge-based society, with high levels of savings and private investment, thereby reducing the country’s dependence on external aid.”


Based on this, the Education Sector Strategic Plan for 2010-2015 states:

“Only a workforce with a sufficient number of people with the necessary skills to operate in an increasingly sophisticated and continuously adapting business environment will allow Rwanda to become the competitive and diversified economy it aspires to be. The Nine-Year Basic Education programme is the foundation for human resource development, while improved access to and quality of upper secondary schools, teacher training colleges, Technical and Vocational Education and Training (TVET) institutions and Higher Learning Institutions will supply the demand for higher level skills and competencies.”


**Singapore**

Singapore has a long history of ICT policy that builds capacity over a fifteen year period but stays focused on the same vision.

“The Ministry of Education has developed the third Materplan for ICT in Education (2009-2014). The third Masterplan (mp3) continues the vision of the first and second Materplans to enrich and transform the learning environments of our students and equip them with the critical competencies and dispositions to succeed in a knowledge economy.”

http://ictconnection.edumall.sg/cos/o.x?c=/ictconnection/pagetree&func=view&rid=665

**South Korea**

The vision of South Korea’s educational technology plan is:

The vision for the execution plan for promotion of ICT in education in 2007 is to ‘establish a new education system to enhance national competitiveness.’ The aim of the plan is to improve accessibility to education, promote local education, and improve education welfare by revitalizing public education, renovating academic education, disseminating lifelong education and augmenting the benefits of education welfare.

United States
A vision of education is articulated in the U.S. National Education Technology Plan:

“Education is the key to America’s economic growth and prosperity and to our ability to compete in the global economy. It is the path to good jobs and higher earning power for Americans. It is necessary for our democracy to work.

With this in mind, America needs a public education system that provides all learners—including low-income and minority students, English language learners, students with disabilities, gifted and talented students, early childhood learners, adult workforce learners, and seniors—with engaging and empowering learning experiences. Our education system also should help learners set goals, stay in school despite obstacles, earn a high school diploma, and obtain the further education and training needed for success in their personal lives, the workplace, and their communities.”


Uruguay
A vision for the role of ICT in the development of young people is articulate by the Agency for eGovernment and the Information Society in Uruguay:

“For the majority of the urban young people, the contribution of ICT played to the possibilities of personal development has been as significant as the contribution to change that paper played to in the reproduction of societies. Some of the aspects of personal development affected by ICT are:

a. The extension of their opportunities for social interaction beyond physical spaces (the house, the neighborhood, the school and the places of relaxation and work).

b. The strengthening of their autonomy and privacy in interaction with friends and partners, in the virtual world, and opportunities to define their own problems and solution strategies, with greater independence of parents or teachers.

c. The increase of their capacities to identify and select people and groups who share attitudes and various interests.

d. The expansion of their opportunities to train the association between efforts and achievements and, therefore, the confidence in their own capacities to reach goals.

e. The emergence of a range of ways to display their creativity and individual development, where senders and receivers of messages can act at the same time like, with the possibility of incorporating the personal stamp of each of them.”

http://www.agesic.gub.uy/innovaportal/v/115/1/agesic/que_es.html
Phase: Envisioning the Future

Step: Define Government and Stakeholders’ Mission

Guidelines and Exercise for Defining Mission

Goal
The goal of this activity is to identify stakeholders for your ICT plan and define their missions. These are the groups that must share the future vision of education, if they are to help transform the system. Many Ministry departments are involved in educational transformation—the departments of curriculum, assessment, teacher training, and ICT (perhaps among others) are all important contributors. Other Ministries might include the Ministries of Telecommunications, Economic Development, and Youth and Social Services. Other stakeholders can make important contributions, as well—private sector industries and businesses, parent and community groups, professional organizations and unions, NGOs, and donors. It is important to identify all the stakeholders and specify their missions. This will provide information needed to analyze the socio-ecosystem and identify potential partners for change.

Resources
In addition to the exercise here, you have the Jordanian Case Study and output from the Creating a Vision exercise.

Output
As a result of this exercise, you will have a list of key stakeholders and their missions. You will also have input into the vision statement, and a revised vision statement, based on this input.

Identifying Stakeholders
Looking at the Jordanian Case Study, identify your own stakeholders among these categories, other agencies or organizations that would be interested in or affected by ICT policy:

King’s/President’s/Prime Minister’s Office

Legislature or Legislative Committees

Ministry of Education Departments
Specifying Missions

Now, for each stakeholder, identify and describe their mission. This is a statement that defines the overall goal of the organization, provides it with a sense of direction, and guides decision-making. Often these are formally stated in the organization’s brochures or websites. If not, you may need to do a bit of reading on the organization and infer the mission.

Stakeholders and their Missions:

Sharing the Vision

Now, next to each mission statement, provide your analysis of how that mission relates to your vision. If the stakeholders were not involved in generating the vision statement, pick those groups that you think are important to share your vision. Circulate your draft statement with them to get their input. Ask them how they relate to the vision and how this vision relates to or overlaps with their vision.

Suggestions for changes in the vision statement by key stakeholders:
Coming to a shared vision:

If it would help to align the visions of the various stakeholders, bring key representatives together to discuss their agreements and differences. List the common elements of the vision across stakeholders:

Revised Vision Statement

With the input that you have from key stakeholders, revise the vision statement to reflect a shared vision.
Phase: Envisioning the Future

Step: Define Government and Stakeholders’ Mission

Case Study: Jordan

As part of the work we did for the Ministry of Education in Jordan, as we helped them generate their ICT plan and strategy, we identified potential stakeholders and described their missions. While this is not a comprehensive list, these departments and organizations were all involved in the Education Reform for the Knowledge Economy, an important initiative of the King’s.

Ministry of Education

Queen Rania Center

A Directorate within the Ministry of Education that has as its mission the support of e-learning and teaching, including all the necessary resources for students, teachers, schools and the local community. They would be responsible for implementing the Ministry’s ICT plan.

Directorate of Information Technology

Closely related to the Queen Rania Center, this Directorate is responsible for deploying and maintaining equipment in schools. Currently, the same person is the Director of both agencies and there is discussion about combining them organizationally.

Directorate of Planning

This Directorate works across the other divisions to collect and maintain data on attendance, grades, and other official student and teacher information. They also generate reports used for decision-making. They are currently leading a component of the Education Reform for the Knowledge Economy (ERfKE) related to school-based decision-making.

Directorate of Training, Qualifications, and Supervision

This Directorate is responsible for all in-service teacher training and for preparing new hires to become teachers. That is, in Jordan, people do not receive formal training as teachers prior to hiring by the Ministry of Education. Rather, the Ministry hires people with degrees in other fields and then trains them to become teachers. They are currently leading a component of ERfKE to revise teacher standards and redesign teacher training based on these.

Directorate of Curriculum and Textbooks

This Directorate specifies the curriculum and publishes textbooks. They are currently leading a component of ERfKE that revises the curriculum around standards.
**Directorate of Tests and Examinations**
This Directorate is responsible for developing, administering, and analyzing student assessments. They are currently experimenting with ICT-based assessments.

**Other Stakeholders**

**Jordan Education Initiative**
This is one of Queen Rania’s non-profit organizations. They are supporting innovation within Jordanian public schools, particularly among a set of “Discovery Schools” which they have identified. These schools are test beds for ICT-based innovative practices.

**National Center for Human Resources Development**
NCHRD is concerned with the enhancement and promotion of human resource development and to improve relevance of outputs of education and training programs. They are also typically the “outside evaluators” for many programs in the Ministry of Education.

**Ministry of Information and Communications**
This Ministry sets the ICT policy for the nation.
Phase: Envisioning the Future

Step: Analyze the Socio-Ecosystem

Guidelines and Exercise for Analyzing the Socio-Ecosystem

Goal
While the outcome of the envisioning exercise in the first step of the envisioning the future phase is a clear, shared vision and a concrete set of images of what the future might be like, the “socio-ecosystem analysis” brings the policy planning process back to the current world. The goal of this step is to analyze the situation as it is right now: What does the current situation look like in schools? What are the strengths of the system? What are the weaknesses? What are the local and global demands and local expectations? What are the challenges and impediments to change?

Resources
In addition to this exercise, you have access to the Jordan case study and the shared vision for the future of education that you generated in previous exercises. You may also want to acquire some of the background readings listed at the end of this exercise.

Output
As a result of this exercise, you will have an articulated analysis of the current state of education in your system and will have identified key differences between the current state and your vision.

Analyzing the Current State
Even though your policy is focused on a particular area—ICT—the socio-ecosystem analysis should consider the current state of all the components of the education system: curriculum and assessment, pedagogy, teacher professional development, school organization and management. The analysis may also go beyond the immediate focus of the policy to include the broader context within which the policy is being made, including world class standards and global educational, social, and economic trends.

You may already have all the needed information in your head. But often the socio-ecosystem analysis requires reading reports, visiting schools, observing classrooms, and interviewing teachers, school leaders, and other Ministry officials. But in any case, the socio-ecosystem analysis is an opportunity to organize and write down all of the relevant information about the current status and trends that can impact on policy and its implementation.
Analyzing the Socio-Ecosystem
Read the Jordanian case study. Then lay out your current knowledge about the current status and trends related to:

Education System

*Professional Development, Teaching and Learning*

Curriculum and Assessment

*School Policy, Organization and Management*

ICT

Social and Economic Trends

Identifying Differences
List the important differences between the current state of your educational system and the vision that you generated in previous steps:
Readings


The book presents a rationale for whole-system education reform and discusses what can be done to bring it about. It analyzes the characteristics of an effective school district, using several districts as examples. It then presents strategies for achieving whole school reform at the district and school level, the state or national level, and the personal level.


The book presents comparative education as a field of study and reviews several different theoretical approaches used in the field. The book then goes on to apply these in analyzing a number of contemporary educational issues, relevant to education policymakers, from the perspectives of different nations. The issues include: educational access and opportunity, accountability and authority, and teacher professionalism. It then goes on to analyze issues from local-global perspectives, using several different globalization analytic frameworks.


This is a study of the conditions that support the performance of the world’s best education systems, among them Singapore and Finland. The study found that funding was not the determinant factor but teacher quality. It concluded that high-performing systems attract the best people to teaching, provide them with skills, and assure that the system is able to deliver the best possible instruction to every student.
Phase: Envisioning the Future

Step: Analyze the Socio-Ecosystem

Case Study: Jordan

As part of our work with the Ministry of Education in Jordan to develop a five-year ICT plan and strategy, the Ministry asked us to do what they called a “situation analysis”. They wanted to be sure we understood how the plan we were recommending fit with the current situation in Jordan but moved it forward toward their vision of an education system that supported the knowledge economy. We spent several weeks reading reports, visiting schools, interviewing principals and teachers, and meeting with the staff of various organizations and Ministry directorates. The following summarizes our findings.

The Socio-Ecosystem in Jordan

Education System

Jordan is considered to have one of the better education systems in the Arab region. Literacy and education participation among the general population is quite high. Government investment in education is significant. For the past eight years, Jordan has been committed to a systemic education improvement policy called Education Reform for the Knowledge Economy. ERfKE efforts address all parts of the education system. The Ministry is now entering the second phase of this reform effort (ERfKE II). The ICT plan and strategy is part of ERfKE II.

Professional Development, Teaching and Learning

Both the pre-service and in-service professional development of teachers are the responsibility of the Ministry of Education. With the exception of teachers in the self-contained classes in Grades 1 through 3, teachers are not hired from a pool of applications selected by the civil service Bureau. These applicants may have no formal preparation as teachers. The MoE must provide training both for these new teachers and for currently practicing teachers. Teacher professional development was a key component of ERfKE I and several initiatives were deployed as part of this reform policy. ICT training was an important part of this and teachers received pay increases and promotions which have been tied to ICT training. In 2006, the National Teacher Professional Standards were developed. In 2010, the MoE

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produced the Policy and Strategic Framework for Teacher Preparation, Utilization and Career Development to provide a coherent policy framework and structured process for teacher professional development.

Currently, pedagogy in Jordan is very traditional. The large majority of classes are organized with the teacher lecturing and students taking notes or providing oral, often choral, responses to the teacher’s questions about content-related facts. ICT is rarely used in courses other than those on ICT literacy. Teachers do not currently have a model for how to integrate ICT into their teaching.

Curriculum and Assessment

The curriculum is also quite traditional, specifying topics to be covered rather than skills to be learned. However, as part of the Education Reform for the Knowledge Economy (ERfKE), the Directorate of Curriculum and Textbooks is leading an effort to revise the curriculum around outcome standards. Among the outcomes are:

- communicate effectively with others in a variety of ways;
- work collaboratively with others in groups and teams;
- use information and communication technologies to locate, manage, analyze and communicate information and to generate and apply knowledge;
- engage in reflective and creative thought about important topics and issues;
- use critical-thinking, problem solving and decision-making skills in an effective way;

Jordan participates in both international student assessment programs: PISA and TIMSS. Students score very low in both programs. The new National Assessment of Knowledge Economy Skills (NAfKE), has been conducted by the NCHRD Monitoring and Evaluation Team for ERfKE I in conjunction with the Directorate of Examinations and Tests, on a representative sample of Grade 5, 9, and 11 students. It was found to be limited in its scope of evaluation of the full range of knowledge economy skills and was confined to three areas: Mathematics, Science and Arabic Reading. The Directorate of Examinations and Tests is experimenting with ICT-delivered assessments.

School Policy, Organization and Management

Education is highly centralized in Jordan. The Ministry sets all of the policies and school principals are responsible for implementing them, as reported to Regional Directorates. Schools are also highly structured. Teachers have relatively little decision making authority or few discretionary resources. Classes are traditionally structured.

However, an important part of ERfKE II is a movement toward school-based management in which school head masters would formulate local school policies and make decisions about school policy based on available data.
ICT

ICT has been a key component of ERfKE I. Jordan has invested heavily in educational ICT and almost all schools in the country now have at least one computer lab. The Ministry of Information and Communications has been involved in an effort to connect schools to the internet. However, school computer labs are used mostly for ICT and technology courses. Very few teachers use ICT as part of their teaching and there is no pedagogical model for the use of ICT.

Research and Evaluation

Currently, evaluation of educational programs and initiatives is conducted either by the National Center for Human Resources Development, an agency independent of the Ministry of Education, or some other contract agency. Evaluations are done on an ad hoc basis, rather than as a regular part of the planning process. However, the Directorate of Planning within the Ministry of Education does collect data on attendance, grades, and other official student and teacher information that is used as part of the planning process.

There is little research on education reform that is done within the Ministry of Education in Jordan or by outside academic research groups.

Social and Economic Trends

Economic development is a major focus of the government in Jordan. Several national economic development plans have focused on developing ICT as both a sector and a productive factor. The major economic development goal is to move Jordan to a knowledge economy and develop the ICT sector so that Jordan is an ICT regional hub. Education improvement is also part of the economic development plan and education reform is couched in this rhetoric—Education Reform for the Knowledge Economy.
Phase: Develop a Master Plan

The Intel Policy Development Guidebook consists of materials organized around the four-phased model of the policy development process: Envision the future, develop a master plan, implement initiatives, and evaluate and adapt. The materials for the phase on Develop a Master Plan consist of four steps: Create a Long-Term Vision; Look for Levers; Build Multi-Stakeholder Alignment; and Design Strategies.

Goal

The materials for the phase on Developing a Master Plan are designed to help you create a long-term, 15-year road map that implements your vision and focus on the next 5 years. The materials will also help you to identify key strengths in your current system and opportunities that can be used as levers, and build alignment among stakeholders that will move toward your vision. Finally, they will help you design a set of strategies, programs, and initiatives that will realize your vision.

Resources

Each step includes a set of online documents (exercises, readings, case studies, and other resources) that will help you create usable outputs and achieve your goals for this phase. Bring with you to these materials a detailed vision of the future that you have for your educational system. If your country (state or municipality) has not already developed one, look at the materials in the first phase of the Development Model dealing with Envisioning the Future.
Output
At the end of the phase on Developing a Master Plan, you will have:

- A long-term roadmap with a detailed plan for the next five years.
- A set of strategic levers that you can use together to launch change.
- A plan for using these levers to align contributions of key stakeholders and elements of the educational vision.
- A plan set of strategies, initiatives, and resources that will allow you to accomplish your plan and realize your vision.
Phase: Develop a Master Plan

Step: Create a Long-Term ICT Plan

Guidelines and Exercise for Creating an ICT Plan

Goal
The goal of this exercise is to help you move from vision to realization, to look at the vision you have for 15 years from now and to chart a path that will make it happen.

Resources
In addition to this exercise and its list of readings, you have access to the detailed case studies of Singapore and Jordan, and your vision statement. If you used the materials in the Envisioning the Future phase of the Policy Development Model, this will be the outcome of those exercises. Or you should have a detailed vision statement that was generated otherwise.

Output
As a result of this exercise, you will have a long-term, 15-year roadmap to accomplish your vision and a shorter-term, 5-year detailed plan.

Begin with Your Vision
Look at your vision, as you refined it in the first phase or one you brought with you. Summarize the key elements below.

What changes are desired in professional development, teaching and learning?

What changes are desired in curriculum and assessment?

What changes are desired in school policy, organization and management?

What changes are desired in evaluation and research?

How will ICT integrate with and support these changes?
## Turning the Vision into a Plan

Now look at the visions and plans for the two attached case studies, Singapore and Jordan. You may also want to look at some of the plans in the readings at the end of this document, if they are available.

Notice how Singapore has worked toward its vision over a 15-year period with three “Master Plans”, mp1, mp2, and mp3, each subsequent plan building on the accomplishments of the previous one and all moving toward their ultimate vision. Notice how the proposed strategic plan for Jordan moves along a 15-year roadmap or trajectory from “Knowledge Acquisition” to “Knowledge Creation”, their ultimate vision in support of the knowledge economy, each subsequent phase building on the previous phases.

Each intermediate phase or plan for these countries has different implications for the use of ICT. In the case of Singapore, the emphasis in mp1 was on the development of ICT skills and the large-scale deployment of ICT in schools and classrooms. With mp2, the emphasis was on the integration of ICT into the curriculum and its use for professional development. And finally, with mp3, the emphasis is on pervasive ICT to support widespread collaborative learning and self-directed learning.

In the case of Jordan, as the country moves from the current emphasis on basic education and school participation to an increased acquisition of knowledge and school-based management, by 2015, the principal and all teachers will have their own computer and each classroom will have a computer with a projector to support blended learning, where traditional instruction is supplemented by the regular use of ICT. As the education system moves toward knowledge deepening, by 2020, and the use of knowledge to solve complex, real-world problems, every classroom will have one or more computer clusters and other digital devices to support collaborative, project-based pedagogy. By 2025, the education system will be based on knowledge creation, in support of the knowledge economy. All students will have immediate access to a wide range of digital devices and resources.

## From a Vision to a Roadmap

Look at your 15-year vision. Break it into three 5-year periods that lead up to the 15-year vision. Describe what you would like the education system to look like at the end of each 5-year period.

At the end of the first five-year period:

At the end of the second five-year period:

At the end of the third five-year period:
How does each step build on the previous one and move toward your long-term vision?

What role does ICT play in supporting this vision?
Readings


This Department of Education-sponsored report examines the ICT policies of 22 education systems. The report serves primarily to inform U.S. policy, so the systems selected are typically developed countries from North America, Europe, and Asia, with a few additional emerging countries that were selected for their informative value. The report includes cases studies from each of these systems, based on review of online resources and interviews with a national participant, typically from the Ministry or a university. The case studies and subsequent cross-case analyses are organized around country context issues and around policy issues that are of particular interest to the Department of Education: the use of ICT to improve student learning, the use of ICT to improve teaching, and the use of data systems for continuous education improvement. A particular focus of the report is on measurement indicators related to each of these issues and the implications of these for Department participation in national and international studies.


This two-volume set describes and analyzes ICT policies in education in 53 African countries. The first volume presents summary findings across topics, such as infrastructure, initiatives at the higher education and primary and secondary levels, activities and issues related to non-formal education, and issues related to gender equity. The second volume presents the 53 case studies, organized by a common template: the education system, ICT policies, current ICT initiatives and projects, and implementing ICT in education: what helps and what hinders.

http://www.ictinedtoolkit.org/usere/login.php

This online toolkit of six “toolboxes” and a total of 19 tools provides interactive instruments and step-by-step guidance to assist users in mapping the national situation, creating a master plan, formulating interventions, planning for implementation, evaluation, and adjustment and scaling.


A guide to planning and deployment of ICT resources in the context of systemic education reform and long-term success. The guide covers the ICT needs of teachers, students, parents, and school administrators in the context of changes in teacher professional development, teaching and learning, and curriculum.

This book presents a detailed description of the goals and components of each of the country’s master plans and then continues with chapters that detail their approach to teacher training, content development and distribution, and infrastructure. Various ICT-based projects and programs are also discussed.


This edited volume includes an introductory chapter on the social and economic drivers of education reform and on a framework for developing ICT policies that support education reform in the service of social and economic development. The book goes on to present ICT policy case studies of five countries: Jordan, Namibia, Rwanda, Singapore, and Uruguay. This is followed by a final chapter that does a cross-case analysis with implications for ICT policy making.


This is a comprehensive collection of education ICT policy case studies, written by researchers from each of 37 countries in North America, Latin America, Europe, Africa, and Asia. Each case study uses a standard format that includes the structure of the education system, ICT policies and practices, and special issues. In addition, there is an introductory chapter and two cross-case analyses, one that looks at curriculum and staff development and another that looks at infrastructure.
Criteria Checklist for a Good ICT Plan

☐ Long-term trajectory (15 years)

☐ The ICT plan’s contribution to national and educational vision is explicit

☐ The ICT plan is explicitly aligned with and contributes to other education changes:
  ☐ Professional Development, Teaching and Learning
  ☐ Curriculum and Assessment
  ☐ School Policy Organization and Management
  ☐ Research and Evaluation

☐ The ICT plan specifies programs and initiatives that will move towards realizing the vision
Phase: Develop a Master Plan

Step: Create a Long-Term Plan

Sample Vision and Long-Term Plan: The Case of Singapore

Singapore’s Vision

Singapore has a long history of ICT policy that builds capacity over a fifteen year period but stays focused on the same vision.

“The Ministry of Education has developed the third master plan for ICT in Education (2009-2014). The third master plan (mp3) continues the vision of the first and second master plans to enrich and transform the learning environments of our students and equip them with the critical competencies and dispositions to succeed in a knowledge economy.”

http://ictconnection.edumall.sg/cos/o.x?c=/ictconnection/pagetreep&func=view&rid=665

Singapore’s Long-Term Plan

Singapore began working toward this vision in 1997, with its first ICT master plan and built on this effort with two subsequent plans1.

The First ICT Master Plan (mp1: 1997-2002)

There were four overarching goals in the master plan 1:

a) To enhance linkages between the school and the world around it;

b) To generate innovative processes in education;

c) To enhance creative thinking, lifelong learning and social responsibility; and

d) To promote administrative and management excellence in the education system.

The key achievements of mp1 were:

a) Students possessed basic skills to complete ICT-based projects or assignments.

b) Teachers possessed basic ICT competencies and were receptive to the use of ICT as a pedagogical tool.

c) Schools have basic infrastructure for ICT-based teaching and learning. The student: computer ratios were 6.6:1 for Primary schools and 5:1 for Secondary schools and Junior Colleges respectively.

d) Sporadic good practices on the use of ICT for teaching and learning in various schools have been identified.

**ICT Master Plan 2 for Education (mp2: 2003-2008)**

Mp2 focused on pedagogical applications of ICT, in particular, engaging students in learning. The plan encouraged the effective and pervasive use of ICT to enhance educational processes and structures. There were six desired outcomes for mp2 and they were:

a) Pupils use ICT effectively for active learning.

b) Connections between curriculum, instruction and assessment are enhanced using ICT.

c) Teachers use ICT effectively for professional and personal growth.

d) Schools have the capacity and capability in using ICT for school improvement.

e) There is active research in ICT in education.

f) There is an infrastructure that supports widespread and effective use of ICT.

Research on this phase documented the achievements of mp2:

a) Students possessed competencies in basic ICT tools, including the use of Internet, email, word processing and presentation software;

b) Teachers, likewise, possessed these basic competencies and two-thirds of the teachers were comfortable in using existing resources to support classroom teaching;

c) About 80% of the schools met the outcome expectation of mp2 and 15% of teachers performed better than expected outcomes; and

d) Schools possessed flexible network environments. All schools have sufficient funding to support student: computer ratios were 6.5:1 for Primary schools and 4:1 for Secondary schools and Junior Colleges respectively.
ICT Master Plan 3 for Education (mp3: 2009-2014)

The third and current ICT master plan (mp3) was launched in August 2008. Four broad directions and goals were laid out that would prepare students for participation in the knowledge economy:

a) Strengthen student’s competencies for self-directed learning. The use of ICT could help to develop skills that are critical for survival in the knowledge age, including self-directed learning, collaborative skills, and critical evaluation of information.

b) Tailor learning experiences according to the way that each student learns best. Teachers need to develop the capacity to design learning activities with ICT that allow individual students to learn in the ways they learn best so as to develop their potential to the fullest.

c) Encourage students to go deeper and advance their learning. ICT tools are leveraged to engage students in authentic and meaningful learning activities for deep learning. For example, to engage students in collaborative analysis of authentic multimedia sources for humanities topics so as to gain deeper understanding and appreciation of different perspectives.

d) Able to learn anywhere. To make use of wireless and mobile technologies to extend learning beyond the physical confine of classroom and structured in-school curriculum time.
Sample Vision and Long-Term Plan: The Case of Jordan

Jordan's Vision

Jordan’s vision was articulated by King Abdallah and linked education reform to economic development such that in the future:

“The Hashemite Kingdom of Jordan has the quality competitive human resource systems that provide all people with lifelong learning experiences relevant to their current and future needs in order to respond to and stimulate sustained economic development through an educated population and a skilled workforce.”


A Long-Term Plan

The Ministry of Education asked us\(^2\) to advise them on their long-term ICT plan and strategy, in support of the King’s vision. We used a developmental model\(^3\) that moves the education system from Basic Knowledge to Knowledge Creation in support of economic and social development.

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Using this model, we proposed a 15-year plan for taking the education system in Jordan through Knowledge Acquisition (2011-2015) to Knowledge Deepening (2016-2020) and on to Knowledge Creation (2021-2025). We described a vision for each phase and a set of goals associated with these visions.

<table>
<thead>
<tr>
<th>Basic Education</th>
<th>Knowledge Acquisition</th>
<th>Knowledge Deepening</th>
<th>Knowledge Creation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2015</td>
<td>2020</td>
<td>2025</td>
</tr>
<tr>
<td>Now</td>
<td>Phase I</td>
<td>Phase II</td>
<td>Phase III</td>
</tr>
<tr>
<td></td>
<td>Knowledge Acquisition</td>
<td>Knowledge Deepening</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2011-2015</td>
<td>2016-2020</td>
<td></td>
</tr>
<tr>
<td>• Increased participation</td>
<td>• Blended learning</td>
<td>• Project-based learning</td>
<td></td>
</tr>
</tbody>
</table>
| • ICT as subject      | • ICT embedded in the curriculum
| • ICT literacy        | • Digital content       |
| • Traditional pedagogy | • School-based decisions |
| • Central control     | • Empowering ERfKE II   |

| • Many schools have one computer lab, used mostly for ICT instruction. | • All schools have two computer labs. |
| • All teachers have a computer. | • All classrooms have at least one cluster of computers, printer, digital camera, probeware, and other peripherals. |
| • Each classroom has an internet-connected computer and display | All students have immediate access to a wide range of digital devices and content. |
| | • Classes will have specialized equipment and digital resources appropriate to needs of specific courses. |

This plan was used to design detailed 5-year strategies—a set of goals and programs—for the Knowledge Acquisition phase.
Phase: Develop a Master Plan

Step: Look for Levers

Guidelines and Exercise for Looking for Levers

Goal
With the previous step, you laid out a long-term plan to realize your vision. As you begin to develop strategies that will help you realize this plan, you want to look for levers that will help bring about change. The goal of this exercise is to help you analyze the current situation and identify sets of levers that you can use to launch change and realize your vision.

Resources
In addition to this exercise, use your vision statement. If you conducted a socio-ecosystem analysis as part of the Envisioning phase, this will help you, too.

Outputs
As a result of going through this analysis, you will have a set of identified levers that you can use to design strategies and programs that will help you realize your vision.

Identifying Levers for Change
Education is a complex system, and as with all complex systems it is composed of a constellation of interlocking, mutually reinforcing components that make the system robust. This interconnection also makes it very difficult to change the system because a change in one component has implications for all of the others. And the status quo in all these components creates resistance that is a major barrier to change. Education change, particularly education transformation, means changing many things, sometimes the whole system. Yet everything cannot change at once. The challenge then is where to start. The answer is often opportunistic and always depends on the situation.

By analyzing the socio ecosystem, you have a picture of the strengths of the system, as well as its weaknesses. One approach to education change is to build on strengths—those components that are closest to the target goals. Building on strengths can provide a lever to make changes in all other parts of the system.

The introduction of a new component, such as ICT, can also be used to launch change in other components. However, it is important to keep in mind that merely introducing new technology will not bring change by itself. It is best to link new technology with other changes. The key is to connect ICT with one or more other components of the system to form a change strategy.
In the case of Jordan, the ICT strategy connected increased investments in technology with teacher training and a new pedagogical model—blended learning. Currently, many teachers in Jordan have received training in the use of ICT (a strength) but very few teachers use ICT on a regular basis (a weakness). Almost all schools have a computer lab but these are used almost exclusively for ICT courses. Over the first five years of Jordan ICT plan, the strategy calls for providing each teacher with a computer, an internet connection in their classroom, and training in blended learning pedagogy. The intent is to increase teachers’ use of ICT to supplement their current instructional approaches. Ultimately within the plan, this will also be accompanied an increase in school-based decision making that will engage principals and teachers in the use of the Ministry’s Education Management Support System to make decisions related to instruction.

**Looking for Levers**

In your own case, take the five year plan that you produced in the previous step and the socio ecosystem analysis you produced as part of the *Envisioning* phase. List the strengths of your current education system related to:

**Professional Development, Teaching and Learning**

**Curriculum and Assessment**

**School Policy, Organization and Management**

**ICT**

Which set of strengths can be used as a lever to help bring about movement towards your vision?

How can you use these strengths to address weaknesses in the system and move toward your vision?

What role can ICT play as a lever for change?

How does ICT reinforce current strengths and provide opportunities to build on them and move toward your vision?
Phase: Develop a Master Plan

Step: Build Multi-Stakeholder Alignment

Guidelines and Exercise for Building Multi-Stakeholder Alignment

Goal

The goal of this exercise is to help you develop a strategy that brings all of the key stakeholders and components of the educational system into a new, mutually-reinforcing alignment that moves toward your vision.

Resources

In addition to this exercise, you will use the materials you’ve developed so far: your vision, your long-term roadmap and short-term plan, and your list of levers.

Output

As a result of this exercise, you will have a list of prospective strategies for bringing alignment over time among the components of the education system and bringing alignment among stakeholders, so that all are moving in the same direction toward the vision.

Building Alignment

The key element in designing a policy strategy is to use the levers you identified to realign the other components and move toward your goals and vision. Identified levers are where you start but over the years of your plan you want to bring about changes in other components to create a new constellation of mutually reinforcing components. Consequently, the strategies you design should bring all of the stakeholders and components into an alignment that works toward the defined goals and vision.

In the case of Jordan, the lever was ICT. The initial strategy was to build on teachers’ ICT skills and provide a computer to each teacher, along with training in blended learning pedagogy. The intent was to align ICT, teacher training, and pedagogy. Parallel efforts would align this with changes in curriculum and assessment intended to support students’ knowledge acquisition. This would also align with school-based decision making, supported by principal and teacher access to an electronic Education Management Support System. Another strategy is aimed at creating a set of Lead Schools that would focus on project-based learning and would provide a lever to moving the system toward more innovative pedagogical, curricular, and assessment approaches that would prepare students for the knowledge economy.
Building Alignment among Components

Take the socio ecosystem analysis that you did in the first phase and the roadmap, plan, and lever analysis that you did in the previous steps of this phase. What strategies can you use to move each of these elements toward an alignment with your vision?

Professional Development, Teaching and learning

Curriculum and Assessment

School Policy, Organization and Management

ICT

Research and Evaluation

Summarize the alignment strategies across components:

Building Alignment among Stakeholders

Which of these key stakeholders can help you make these adjustments? What roles does each stakeholders play in bringing alignment?

King’s/President’s/Prime Minister’s Office

Legislature or Legislative Committees

Ministry of Education Departments
Other Ministries or their Departments

Parent or Community Groups

Professional Organizations and Unions

Private Sector Enterprises and Organizations

NGOs and Donors
Phase: Develop a Master Plan

Step: Design Strategies

Guidelines and Exercise for Designing Strategies and eLearning Programs

Goal
The goal of this exercise is to extend your plan to include detailed strategies and eLearning programs and initiatives that will help you move along your path and realize your vision for a future education system enabled by technology. You will focus on your plan for the next five years, turning the vision into measurable goals, and specifying eLearning programs that will help realize them.

Resources
In addition to this exercise, you have access to a collection of strategies across countries and a detailed case study of Jordan. You will also use the output from previous exercises. You may want to examine the infoDev Toolkit for Policymakers and the Intel eLearning Deployment Guide mentioned in the earlier step on Creating a Long-Term Plan.

Output
When you complete this exercise, you will have a very detailed, year-by-year specification.

From a Plan to Strategies
Restate the vision for the end of the first five years of your plan, as you described it in the Planning exercise:

Now look at the case study of Jordan and see how the plan for the first five years was used to generate corresponding measurable goals for each of the five years. The plan built on other efforts the Ministry was engaged in as part of its policy, Education Reform for the Knowledge Economy. The first phase of the plan centered on blended pedagogy where teachers regularly use ICT and digital content to supplement their traditional teaching approaches, across the curriculum. It also emphasized the development of school-based decisions, where principals and teachers would use data on a regular basis to make managerial and instructional decisions. The strategies and actions included increasing the number of computer labs in schools, providing each school principal and every teacher with a computer, developing digital content, and providing professional development in both ICT skills and blended learning pedagogy. Computer-based assessments of ‘knowledge economy skills’ would allow them to measure the impact of these changes on student learning.
Also look across the collection of strategies from other countries. With these in mind, list the strategies that you think would move toward realizing your vision at the end of the next five years. As appropriate, include strategies related to:

Professional Development, Teaching and Learning:

Curriculum and Assessment:

School Policy, Organization and Management:

Research and Evaluation:

Summarize the strategies here:

Strategy 1:
Strategy 2:
Etc.

The use of ICT and eLearning programs that supports these changes:

Technology:

Connectivity:

Digital content:
From Strategies to Actions

For each strategy above, list a set of actions that would support the strategy:

- Strategy 1, Action 1:
- Strategy 1, Action 2:
- Strategy 2, Action 1:

Etc.

Measurable Goals

Take a look at the Jordanian case. Notice that measurable goals were specified for each action the final year of the plan. Then progress measures were estimated for each subsequent year.

Now, for the year five of your plan, specify measurable goals for each of the strategies and actions above and complete the following table, extending your work from Step 10.

<table>
<thead>
<tr>
<th>Strategies and Actions</th>
<th>Year 5</th>
<th>Year 4</th>
<th>Year 3</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 1; Action 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategy 1; Action 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Etc.
Criteria Checklist for a Good ICT Strategies

☐ Short-to-mid-term action plan (1-5 years)

☐ The plan lists a set of strategies and actions across the five years

☐ The plan addresses:
  ☐ Professional Development, Teaching and Learning
  ☐ Curriculum and Assessment
  ☐ School Policy, Organization and Management
  ☐ Research and Evaluation

☐ The plan specifies the eLearning components needed to implement these strategies
  ☐ Technology
  ☐ Connectivity
  ☐ Digital content

☐ The plan lists measurable goals or metrics of success for each of the components

☐ These goals are phased in over a five-year period
Phase: Develop a Master Plan

Step: Design Strategies

The Case Study of Jordan

When the Ministry of Jordan asked us to help them design an educational ICT plan and strategy, we proposed a 15-year plan to achieve their vision and a detailed set of strategies and actions for the first phase that covered the years 2011-2015. Using our conceptual model, we designed strategies to take the education system from its current state, focusing on Basic Education, to one focused on Knowledge Acquisition, on the way to Knowledge Deepening and Knowledge Creation, in subsequent phases. The emphasis the Knowledge Acquisition phase was on:

- Blended learning pedagogy
- ICT embedded in the curriculum
- Digital content
- School-based decisions
- Empowering Jordan’s Education Reform for the Knowledge Economy (ERfKE)

In supporting ERfKE, the strategies connected with all the key areas of Jordan’s education reform—teacher professional development, pedagogy, curriculum, assessment, and school organizations—as well as ICT.

Then we identified three strategies and a set of actions designed to accomplish:

Strategy 1: Implement Blended Learning Pedagogy

Action 1: Train all teachers and principals in the use of blended learning pedagogy.

Action 2: Embed blended learning materials and assessments throughout the curriculum.

Action 3: Provide each teacher with a computer and high-speed internet access.

Strategy 2: Implement School-Based Management

Action 1: Conduct an “information needs assessment.”

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Action 2: Train all principals and teachers in the use of the Education Management Support System (EMSS).

Action 3: Assure that all principals and teachers have easy access to EMSS.

Action 4: Require all schools to submit school-based ICT plans.

Strategy 3: Assess Knowledge Economy skills

Action 1: Develop and field test ICT-based assessments of knowledge economy skills.

We also recommended a fourth strategy to support the transition from the first phase, Knowledge Acquisition, to the second phase, Knowledge Deepening, scheduled for 2016-2020.

Strategy 4: Institute a Lead School Program

Action 1: Set up a “Lead Schools” program to support school-based innovation.

Action 2: Work with Lead Schools to begin to develop project-based training and materials.

Action 3: Provide additional resources to Lead Schools and hold schools accountable for their use.

We then proposed target goals for each year in the first phase, for each of the areas:

<table>
<thead>
<tr>
<th>Professional Development</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UNESCO ICT Teacher Standards will be adopted</td>
<td>25% of teachers will have been trained in blended-learning pedagogy</td>
<td>50% of teachers and principals will have been trained in blended-learning pedagogy</td>
<td>75% of teachers and principals will have been trained in blended-learning pedagogy</td>
<td>100% of teachers and principals will have been trained in blended-learning pedagogy</td>
</tr>
<tr>
<td></td>
<td>Training materials developed or identified for the “Technology Literacy Standards”</td>
<td>MoE will have developed EMSS training for principals and integrated it into school-based decision making</td>
<td>Training materials developed or identified for UNESCO “Knowledge Deepening Standards” and project—based learning</td>
<td>50% of teachers in Lead Schools will be trained in project-based learning</td>
<td>100% of teachers and principals in Lead Schools will be trained in project-based learning</td>
</tr>
<tr>
<td></td>
<td>MoE will have developed or identified teacher training materials for blended-learning pedagogy</td>
<td></td>
<td></td>
<td>75% of principals will have been trained on using the EMSS to support school planning</td>
<td>100% of principals and teachers will have been trained on using the EMSS to support school planning</td>
</tr>
</tbody>
</table>

The table above outlines the measurable goals for each phase of the ICT Policy Development initiative.
<table>
<thead>
<tr>
<th>Pedagogy</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey constructed and field tested on ICT-based pedagogy</td>
<td>25% will be using blended pedagogy in 1 lesson per week</td>
<td>50% will be using blended pedagogy in 1 lesson per week</td>
<td>75% will be using blended pedagogy in 1 lesson per week, 50% in 2 or more lessons</td>
<td>90% will be using blended pedagogy in 1 lesson per week, 70% in 2 or more lessons</td>
<td>80% of Lead School teachers will be using project-based pedagogy in 1 lesson per week, 50% in 2 or more lessons</td>
</tr>
<tr>
<td>30% of students will demonstrate ICT literacy</td>
<td>60% of students will demonstrate ICT literacy</td>
<td>90% of students will demonstrate ICT literacy</td>
<td>100% of students will demonstrate ICT literacy</td>
<td>MoE will have identified or developed content that implements blended learning for 100% of the curricula</td>
<td>70% of teachers will be creating supplemental curriculum materials</td>
</tr>
<tr>
<td>MoE will develop standards for blended learning curriculum materials and begin identifying or developing content that implements these standards</td>
<td>MoE will have identified or developed content that implements blended learning for 40% of the curricula</td>
<td>MoE will have identified or developed content that implements blended learning for 60% of the curricula</td>
<td>MoE will have identified or developed content that implements blended learning for 80% of the curricula</td>
<td>MoE will have identified or developed content that implements blended learning for 100% of the curricula</td>
<td>MoE will have identified or developed content that implements project-based pedagogy for 20% of the curriculum and make these available to Lead Schools</td>
</tr>
<tr>
<td>MoE will begin integrating ICT in standards across the curriculum</td>
<td>MoE will begin field testing ICT-delivered assessment online</td>
<td>MoE will provide the option of taking targeted ICT-delivered assessment online</td>
<td>MoE will provide the second national assessment to be delivered only online</td>
<td>MoE will offer at least one targeted assessment delivered only online</td>
<td>MoE will provide a 2nd targeted assessment that can be optionally taken online</td>
</tr>
<tr>
<td>Curriculum</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
<td>2014</td>
<td>2015</td>
</tr>
<tr>
<td>30% of students will demonstrate ICT literacy</td>
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<td>90% of students will demonstrate ICT literacy</td>
<td>100% of students will demonstrate ICT literacy</td>
<td>MoE will have identified or developed content that implements blended learning for 100% of the curricula</td>
<td>70% of teachers will be creating supplemental curriculum materials</td>
</tr>
<tr>
<td>MoE will develop standards for blended learning curriculum materials and begin identifying or developing content that implements these standards</td>
<td>MoE will have identified or developed content that implements blended learning for 40% of the curricula</td>
<td>MoE will have identified or developed content that implements blended learning for 60% of the curricula</td>
<td>MoE will have identified or developed content that implements blended learning for 80% of the curricula</td>
<td>MoE will have identified or developed content that implements blended learning for 100% of the curricula</td>
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</tr>
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<td>MoE will provide the second national assessment to be delivered only online</td>
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<td>MoE will provide a 2nd targeted assessment that can be optionally taken online</td>
</tr>
<tr>
<td>Assessment</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
<td>2014</td>
<td>2015</td>
</tr>
<tr>
<td>Assessments will be developed to measure student and teacher ICT literacy</td>
<td>MoE will field test targeted ICT-delivered assessment online</td>
<td>MoE will provide the option of taking targeted ICT-delivered assessment online</td>
<td>MoE will provide the second national assessment to be delivered only online</td>
<td>MoE will offer at least one targeted assessment delivered only online</td>
<td>MoE will provide a 2nd targeted assessment that can be optionally taken online</td>
</tr>
<tr>
<td>MoE will identify one national assessment to be delivered via ICT and begin working on items and procedures</td>
<td>MoE will provide the second national assessment to be delivered only online</td>
<td>MoE will provide a 2nd targeted assessment that can be optionally taken online</td>
<td>MoE will have developed and field tested an ICT-based assessment of KE skills</td>
<td>MoE will have developed and field tested an ICT-based assessment of KE skills</td>
<td>MoE will have developed and field tested an ICT-based assessment of KE skills</td>
</tr>
<tr>
<td>At least 25% of students taking this test will demonstrate mastery at least 60% of students in Lead Schools</td>
<td>MoE will provide the second national assessment to be delivered only online</td>
<td>MoE will provide a 2nd targeted assessment that can be optionally taken online</td>
<td>MoE will have developed and field tested an ICT-based assessment of KE skills</td>
<td>MoE will have developed and field tested an ICT-based assessment of KE skills</td>
<td>MoE will have developed and field tested an ICT-based assessment of KE skills</td>
</tr>
</tbody>
</table>
2011
- MoE will conduct an information needs assessment, specifications for EMSS, assessment, and instructional system generated, vendor contracted

ICT
- All current computers in schools are checked and any non-operating or outdated computers are replaced
- 50% of teachers will have an email account
- 25% of students will have an email account
- 25% of teachers will have immediate access to a computer
- 100% of principals will have access to a computer in the office

2012
- An integrated EMSS, assessment, and instructional system will be in place in the MOE
- 10% of classrooms will have at least one networked computer and projection equipment
- 20% of schools will have two or more computer labs
- 40% of schools have high-speed connections to the internet
- 75% of teachers will have an email account
- 50% of teachers will have immediate access to a computer
- 50% of students will have an email account

2013
- 50% of principals will be using EMSS to support school-based planning and decision making
- 25% of principals, supervisors engage in instructional leadership
- 30% of classrooms will have at least one networked computer and projection equipment
- 40% of schools have two or more computer labs
- 75% of schools have high-speed connections to the internet
- 100% of teachers will have an email account
- 75% of teachers will have immediate access to a computer
- 75% of students will have an email account

2014
- 75% of principals will be using EMSS to support school-based planning and decision making
- 50% of principals, supervisors engage in instructional leadership
- 50% of classrooms will have at least one networked computer and projection equipment
- 60% of schools have two or more computer labs
- 100% of schools have high-speed connections to the internet
- 100% of teachers will have an email account
- 70% of classrooms have at least one networked computer
- 100% of teachers will have immediate access to a computer

2015
- 100% of principals will be using EMSS to support school-based planning and decision making
- 75% of principals, supervisors engage in instructional leadership
- 70% of classrooms will have at least one networked computer and projection equipment
- 80% of schools will have two or more computer labs
- 100% of schools have high-speed connections to the internet
- 100% of teachers will have an email account
- 70% of classrooms have at least one networked computer
Phase: Develop a Master Plan

Step: Design Strategies

Example Strategies from Around the World

Finland
As part of its National Information Society Policy, Finland stated:

“Utilisation of ICT in education

A project OpetusTIME will be implemented. Projects requiring national architecture, solutions or guidelines will be carried out in ICT-centered areas of technological infrastructure in education. These include projects regarding information service for education service providers, teaching material service, national intellectual capital register, information service for education and training applicants, and electronic search. The use of ICT in teaching and studying will be promoted.”


Hong Kong
In support of its vision, Hong Kong specified a five-year strategy:

“The first Five-year Strategy has successfully provided the necessary infrastructure for IT in education to take off. Building upon the current strengths and having regard to the barriers identified, the next strategy will focus on the following –

(a) using IT as a lever to support and advance the Education Reform initiatives;
(b) fostering the development of leadership capacities in schools to develop holistic and strategic school plan for making effective uses of IT to realize the school’s vision and goals;
(c) better integration of IT into the curriculum as well as the learning and teaching processes;
(d) defining Information Literacy levels to set targets for students to develop IT skills and use them for learning and communication; and
(e) building partnership among various stakeholders to undertake initiatives, and pooling efforts, funding and expertise from various parties to sustain the momentum.

Namibia
Among the strategies identified in Namibia’s Education Sector Training and Improvement Programme are those in the areas of:

“The quality of general education (grades 1 – 12) is to be improved through a wide range of measures. The curriculum will be revised to ensure that it meets the demands of a knowledge-based economy. The supply of textbooks and other learning materials will be increased. New standards will be enforced. Systems of performance management and accountability will be introduced, including licensing of teachers and performance targets for each school. National tests will be introduced in grades 5 and 8 to supplement existing national examinations at grades 10 and 12. Support for teachers will be stepped up through re-organised inspection and advisory services, and the cluster system, in terms of which 4 - 8 schools in one vicinity are grouped together. Special education will be enhanced, initially through policy development.

Information Communication Technology will be rapidly spread throughout the sector to enhance learning and administration. The curricula will be revised to make ICTs a cross-curricular tool as well as a subject. Staff will be trained, and ICT services and support structures developed, so that technology can be deployed and maintained. Education management will also be enhanced through the use of ICTs.”

http://www.tech.na/etsip.htm

Portugal
In supporting its vision, Portugal designed a plan with three strategic components:

Technology:

- Technology kit: increased number of computers and support equipment inside and outside classroom
- High-speed broadband Internet
- Internet in the Classroom
- School Card: Electronic report card
- School Safety: Electronic safety system
Contents

- School Portal: School portal with content sharing, distance learning, and collaborative tools
- Simplex School: Management support electronic tools
- Institutional Portal: Communication platform between citizens and the Ministry of Education

Training

- ICT Competencies Training and Certification: Restructuring teachers’ ICT training
- Electronic Assessment: Use of computers in student assessment
- ICT Internships: Opportunities for student internships in the ICT field
- ICT Academies: Training of staff, teachers, and students to certification by industry standards


Rwanda

Rwanda’s Education Sector Strategic Plan, 2010-2015 lists these strategies for educational ICT:

“1. promoting an ICT in education culture - through the development of outreach material and the building of a common platform designed to raise awareness of the benefits and limitations of ICT in education, share ICT in education resources and good practices, and position Rwanda with regard to international standards and the EAC in particular;

2. fostering and managing ICT in education initiatives through development of a framework and guidelines to build and strengthen partnerships between different stakeholders and encourage participation of local institutions (private, public and civil society) in ICT in education;

3. expanding ICT infrastructure to increase access through providing power, connectivity and equipment to educational institutions, particularly at the primary and secondary levels and outside the main cities and maintaining and upgrading existing infrastructure;

4. developing capacity to integrate the use of ICT into education practices through training of teaching staff on integrations of ICT into the teaching practice, development of ICT standards and competencies and provision of technical and pedagogical support in schools;

5. developing and distributing quality digital content and ensuring that this content is adapted to the Rwandan context and aligned with the national curriculum;
6. establishing Open, Distance and e-Learning (ODEL) through development of an ODEL policy and costed strategy, building on existing initiatives at the higher education level through development of bridging courses for entry into NUR and using the Rwanda Education Commons programme as a vehicle for increasing teachers’ knowledge and pedagogical skills through ODEL. Training institutions in underserved areas will be particularly targeted as will learners at the secondary level who have dropped out of the education system. As ICT in education is a particularly dynamic field, innovative solutions in the areas of infrastructure, capacity and digital content development will be fostered whenever possible in order to answer needs in those rural areas where alternative ICT in education solutions are required.”


**Singapore**

Four broad strategies are at the core of Masterplan 3 (mp3):

- To strengthen integration of ICT into curriculum, pedagogy, and assessment to enhance learning and develop competencies for the 21st century.
- To provide differentiated professional development that is more practice-based and models how ICT can be effectively used to help students learn better.
- To improve the sharing of best practices and successful innovation.
- To enhance ICT provision in schools to support the implementation of mp3.

The strategies will be implemented through 5 key strands:

**ICT in Curriculum, Pedagogy, and Assessment**

- Embedding ICT-enriched learning experiences into the syllabuses
- ICT for assessment
- The ICT Connection: a platform that supports the growth of ideas and innovations in schools by facilitating dialogue among educators
- Baseline ICT standards for students

**Cyber Wellness**

- Cyber Wellness framework for curriculum integration
- Cyber Wellness research
- Student Ambassador programme: leverage positive peer influence to promote cyber wellness
- Cyber Wellness Resource and Development
Professional Development

- ICT-PD Framework: Defines the respective roles, responsibilities and corresponding set of competencies for the different groups of school personnel implementing ICT in schools.
- ICT Mentors: Teachers who will mentor other teachers on ICT use for learning and teaching in their respective disciplines.
- Consultancy and support for schools through customized development programs.
- Recognition program for teachers

Research and Development

- EduLab: Research to strengthen teachers’ pedagogical understanding of ICT use by translating research and innovation into learning and teaching practices.
- FutureSchools@Singapore: to push the frontier of teaching and learning at a school-side level to fully harness ICT to engage students in learning.
- Interactive and Digital Media: Prototyping and studying IDM-based learning environments.

ICT Infrastructure

- Bandwidth provision: Upgrade bandwidth of all schools to 20Mbps.
- ICT provision norms: Improving student-computer ration to facilitate independent, collaborative, and customized learning.

http://ictconnection.edumall.sg/cos/o.x?c=/ictconnection/pagetree&func=view&rid=748

Uruguay

Plan Ceibal is central to Uruguay’s vision of the future\(^6\). The Plan consists of four components:

1. One laptop for every child and teacher of all public schools: Participation in the One Laptop per Child program, with XO computer and Sugar operating system for each child
3. ICT training for teachers and ICT support for families: Technical support and technical and pedagogical training for teachers.
4. Generation of digital educational resources: Educational portals which provide digital content and support the exchange of experiences and good practices among teachers.

The Intel Policy Development Guidebook consists of materials organized around the four-phased model of the policy development process: Envision the future, develop a master plan, implement initiatives, and evaluate and adapt. The materials for the Phase on Implementing Initiatives consist of two steps: Team with Partners and Provide Resources.

**Goal**

The materials for the Phase on Implementing Initiatives are designed to help you move from plans to actions—to implement your plan by teaming with partners and by specifying and mobilizing resources.

**Resources**

Each step in this phase includes a set of online documents (exercises, readings, case studies, and other resources) that will help you create usable outputs and achieve your goals for the phase. Bring with you to these materials a detailed master plan. If your country (state or municipality) has not already developed one, look at the materials in the second phase of the Development Model dealing with *Develop a Master Plan*. Also, have an analysis of stakeholders and an analysis of the socio-ecosystem. If you do not have these, turn to the materials in the *Envision the Future* phase.

**Output**

At the end of the Phase on Implement Initiatives, you will have:

- Identified a set of partners and designed a management structure that will allow you to implement your master plan.
- Specified a set of resources, developed a budget, and identified a set of potential funding sources for your plan.
Phase: Implement Initiatives

Step: Team with Partners

Guidelines and Exercise for Teaming with Partners

Goal
Implementing a five-year strategy can be a daunting task. It requires a management plan and, often, partners. The goal of this step is to identify partners and design a management structure that can help you implement your plan.

Resources
In addition to this exercise, you have access to the Jordanian case study. You should also have your detail master plan, your Stakeholder Analysis and your Socio-Ecosystem Analysis, developed in previous phases.

Output
As a result of going through this exercise, you will develop a management plan, including a list of partner organizations, along with a way of coordinating those partners.

Organizational Structure
Read over the Jordanian Case Study. Make a list of all your strategies and each of their actions from your Master Plan. Review your Stakeholder Analysis and your Socio-Ecosystem Analysis. Given the missions of each of the stakeholders, for each strategy and action, list the organizational partner that would best implement that action, filling in the following table:

<table>
<thead>
<tr>
<th>Strategy and Action</th>
<th>Responsible Organizational Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 1</td>
<td></td>
</tr>
<tr>
<td>Action 1:</td>
<td></td>
</tr>
<tr>
<td>Strategy 1</td>
<td></td>
</tr>
<tr>
<td>Action 2:</td>
<td></td>
</tr>
<tr>
<td>Strategy 1</td>
<td></td>
</tr>
<tr>
<td>Action 3:</td>
<td></td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
</tr>
</tbody>
</table>
Management Plan
Can you rely on current organizational structures to implement all of the actions of your plan? If not, what additional organizational structure must be created?

If you need to create a new organizational structure or structures, please indicate why it is needed, what the structure will be, where it will be organizationally placed (i.e. to whom will it report?), and what specifically its responsibilities will be.

Is there an organizational unit that will be able to coordinate the implementation strategies and actions across stakeholders to bring them into alignment and move toward your vision? If not, what organizational structure must be created to coordinate and manage the actions across organizational partners? Where will it be organizationally placed (i.e. to whom will it report?)?
Phase: Implement Initiatives

Step: Team with Partners

Sample Management Plan: The Case of Jordan

As part of our work with the Ministry of Education in Jordan\(^1\) to develop a five-year ICT plan and strategy, the Ministry asked us to recommend a management plan. For each of the strategies and actions, we identified an organizational unit or partner that seemed best positioned to be responsible for that action. This is described in the attached table. In addition, we recommended the following structure to manage the implementation of the plan.

*Managerial Structure: Steering Committee and Matrix Structure*

We recommend that the ICT Plan and Strategies be managed by a team of leaders from all of the affected directorates that constitute a Steering Committee. We recommend that the Steering Committee be Chaired by the Director of the Queen Rania Center, as the agency most responsible for ICT policy matters. The establishment of a MoE Program Management Office (PMO) would greatly aid the Steering Committee in the functions described below and facilitate the coordination and management of vendors.

To assure transparency, the Steering Committee may also include outside, non-voting members, such as the Executive Director of Jordan Education Initiative (JEI) or members of the private sector. The Steering Committee should meet periodically—at least quarterly and ideally monthly for the first year of the project—to monitor progress on each of the Strategies and Actions. We recommend that the Chair and the Steering Committee would be responsible for resources assigned to the Plan. The Chair would report directly to the Secretary General and the Minister of Education and would be accountable to them for the distribution of resources and progress towards goals.

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We recommend a matrix structure for assigning staffing responsibilities associated with each component of the Plan. Each of the Strategies and Actions require a diverse set of expertise which typically is not located in a single organizational unit. For example, the development of digital content requires specialized knowledge of the capabilities of the technology, specialized understanding of the student learning process, and specialized expertise in curriculum and subject matter content. The development of ICT-based assessments requires specialized knowledge of capabilities of the technology and specialized knowledge of assessment. Consequently, we recommend that project-based teams from various directorates be formed to work on specific strategies and actions. We suggest the agencies that might participate in these teams under each of the Actions below but it would be the responsibility of the Steering Committee—along with corresponding Directors—to structure, membership, and leadership of these teams.

<table>
<thead>
<tr>
<th>Strategy and Action</th>
<th>Responsible Organizational Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 1</td>
<td></td>
</tr>
<tr>
<td>Action 1: Train all Teachers and principals in blended learning pedagogy.</td>
<td>QRC, DoT, perhaps JEI</td>
</tr>
<tr>
<td>Strategy 1</td>
<td></td>
</tr>
<tr>
<td>Action 2: Embed blended learning materials and assessments throughout the curriculum.</td>
<td>QRC, DoCT, perhaps JEI</td>
</tr>
<tr>
<td>Strategy 1</td>
<td></td>
</tr>
<tr>
<td>Action 3: Provide each teacher with a computer and high-speed internet access.</td>
<td>QRC and DoIT</td>
</tr>
</tbody>
</table>

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2 QRC Queen Rania Center  
DoP Directorate of Planning  
DoT Directorate of Training, Qualifications, and Supervision  
DoIT Directorate of Information Technology  
DoCT Directorate of Curriculum and Textbooks  
DoTE Directorate of Tests and Examinations  
JEI Jordan Education Initiative  
NCHRD National Center for Human Resources Development
<table>
<thead>
<tr>
<th>Strategy 2</th>
<th>QRC and DoP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action 1: Conduct information needs assessment.</td>
<td></td>
</tr>
<tr>
<td>Action 2: Train all principals and teachers in the use of EMSS.</td>
<td></td>
</tr>
<tr>
<td>Action 3: Assure that all principals and teachers have easy access to EMSS.</td>
<td></td>
</tr>
<tr>
<td>Action 4: Require all schools to submit school-based ICT plans.</td>
<td></td>
</tr>
<tr>
<td>Strategy 3</td>
<td>QRC and Field Directorates</td>
</tr>
<tr>
<td>Action 1: Set up Lead Schools program.</td>
<td></td>
</tr>
<tr>
<td>Action 2: Begin developing project-based training and materials.</td>
<td></td>
</tr>
<tr>
<td>Action 3: Provide additional resources to Lead Schools and hold them accountable.</td>
<td></td>
</tr>
<tr>
<td>Strategy 4</td>
<td>QRC, DoTE, an perhaps NCHRD</td>
</tr>
<tr>
<td>Action 1: Develop and field test ICT-based assessments of knowledge economy skills.</td>
<td></td>
</tr>
</tbody>
</table>
Phase: Implement Initiatives

Step: Provide Resources

Guidelines and Exercise for Providing Resources

Goal
The goal of this exercise is to help you specify the ICT resources that will be needed to implement your plan, to figure a budget for these resources, and to identify potential funding sources.

Resources
In addition to this exercise, you have access to a list of additional resources that can help you consider all of your potential ICT needs and costs.

Output
As a result of this exercise, you will have a list of needed resources for your plan, a budget, and a list of potential funding sources.

Needed Resources
The intent of this exercise is to help you think through the ICT resources that you will need to allocate, in order to implement your plan. These include personnel and materials, as well as hardware, software, networks, maintenance, and technical assistance. These resources should be appropriate in scope to the goals of the plan and mobilized according to the strategy schedule. Financial resources are, of course, an important component of this.

The resources addressed here are specific to ICT. There may be additional costs associated with curriculum and assessment reform and professional development costs beyond those listed here. Because these are idiosyncratic to your specific plan, it is difficult to provide you with guidelines for these. But the analysis below should help you estimate the significant costs, both initial and ongoing costs and both capital and personnel costs, directly associated with ICT.

But even here, it is impossible to give specific costs in a general guideline. Because labor, transportation, and even hardware costs vary significantly from country to country the best that can be done is provide you with a general structure of costs that you can fill in, subject to the specific prices of a country. The categories provided below are related to the costs of implementing ICT. But we do provide a structure to figure the “total costs of ownership” not just the costs associated with the initial purchase. This structure will help you figure a gross estimate of costs that you can use to fund your plan. More-specific guidelines will be needed at the time of purchase by those tasked with implementing the plan.
From Strategies and Actions to Resources

Summarize here the strategies, year-by-year, which you designed in the strategy design exercise:

For each of the strategies and each year, use the following guidelines to specify the needed ICT resources:

*Initial costs*

**Hardware**
- Computer
- Display
- Connectivity
- Routers
- Servers

**Software**
- Operating systems
- Virus protection
- General purpose applications (word processing, etc.)
- Educational management system

**Peripherals**

Physical infrastructure (computer desks, chairs, mobile carts, etc.)

Electrical system (connect to the grid, sufficient outlets, surge protectors)
Content and applications

- Off-the-shelf instructional software
- Custom content development

User training and support

- Initial administrator, teacher, and student training

Maintenance and technical support

- Setup and maintenance
- Technical support call center

Management, Monitoring, and Reporting

- Organizational structure to deploy

Ongoing Costs

Services

- Electricity
- Internet service
- Security
- Insurance

Up-grade for content and applications

Recurring training

- Pedagogical integration

Upgrades and planned replacement of hardware

On-going management personnel

Cost Savings

As you are estimating costs of the plan, it is also worth estimating the costs savings of the plan. For example, in Jordan we estimated that the Ministry would save tens of millions of dollars in textbooks when all curriculum materials were put online by the end of the second phase of the plan. In addition, tens of millions more would be saved when all testing was done online during that phase.
List any cost savings that can be expected, as a result of the implementation of the plan.

**Sources of Funding**

Review the needed resources and estimate budget. Consider the following sources of funding:

**National funding**

- Office of the King, President, Prime Minister
- Ministry of Education
- Ministry of ICT and Telecommunications
- Other relevant Ministries

**State of Provincial funding**

**Donor Governments and Multinational Organizations**

**NGOs, Foundations**

**Private-Public Partnerships**

- Telecommunications companies
- Banks
- Technology companies

**Funding by teachers, parents, students**

**Additional Resources**


Global E-Schools and Communities Initiative (2009). Buyers’ guide for ICTs in Education.  

http://www.ictinedtoolkit.org/usere/login.php


Intel Guidebook for ICT Policy Development

Phase: Evaluate and Adapt

The Intel Policy Development Guidebook consists of materials organized around the four-phased model of the policy development process: Envision the future, develop a master plan, implement initiatives, and evaluate and adapt. The materials for the Evaluate and Adapt Phase consist of three steps: Monitor, Adapt, Revise; Measure Success; and Recommend Change.

Goal
The materials for the Evaluate and Adapt Phase are designed to help you design an evaluation plan, specify metrics for success, and schedule reviews.

Resources
Each step includes a set of online documents (exercises, readings, case studies, and other resources) that will help you create usable outputs and achieve your goals for this phase. Bring with you to these materials the detailed master plan and implementation plan that you developed in earlier phases. If your country (state or municipality) has not already developed one, look at the materials in the second phase of Development Model dealing with Develop a Master Plan.

Output
At the end of the Phase on Evaluate and Adapt, you will have:

- A detailed Monitoring and Evaluation Plan.
- Specification for a set of indicators of success for your measurable goals.
- A schedule of reviews that might indicate the need for change.
Phase: Evaluate and Adapt

Step: Monitor, Adapt, Revise

Guidelines and Exercise for Planning an Evaluation

Goal
The goal of this exercise is to help you develop an evaluation and monitoring plan that can help you track the success of your strategies and make adjustments, across the years of the plan.

Resources
In addition to these materials, you have access to the Jordanian Case Study. You may have access to additional resources listed at the end of this exercise.

Output
As a result of this exercise, you will have an evaluation plan that includes the study design and the specification of data collection approaches.

Designing an Evaluation
Professor Dan Wagner presents a conceptual model for planning the evaluation of ICT-based initiatives. The conceptual framework maps onto the developmental trajectory of an ICT initiative, from its implementation, to its immediate influence on teacher and student practices (outcomes), to impact on student learning and graduation, and ultimately to its long-term social or economic impact.

No one would expect an initiative to have an impact on the economy after its first or second year. And it would be inappropriate to measure impact on student learning, for the first several months after deployment, particularly if it is not known the extent to which the initiative has been implemented. In the early phases of the project, the emphasis should be on the extent to which the project is being implemented as planned and a large majority of the teachers and schools are participating. As the project becomes widely implemented, one can reasonably expect it to have the intended outcomes related to teacher skills and practices and student skills, attitudes, and knowledge. As the program continues, one can expect larger impacts on student graduation rates, post-graduation hiring, and so on.

After some extended period, one could reasonably hope—although not always be able to measure—the impact of the program on economic or social development and contribute to realizing the country’s ultimate vision for the future.

This framework is a good way to take your strategies, as determined in Step 7, and plot out a series of evaluations appropriate to the particular phase of your initiative.

**From Strategies and Actions to Evaluation**

In Step 7, Designing Strategies, you laid out a set of strategies and actions over a five-year period. You also specified a set of related, measurable goals for each year over the five years. With this exercise, you will design an evaluation plan that will allow you to collect the data you need to monitor your progress during these five years.

Typically there are three sorts of designs:

1. Sample survey
2. Case study
3. Comparative study

**Sample Survey**

A survey is used to determine the extent to which something is happening. Because only a sample of participants is used, it can be an inexpensive yet reliable way to make such determinations and infer them to the entire population. However, to be reliable, the survey must be based on a random sample of teachers, students, etc. Because survey data are easy to quantify, they are also easy to analyze, using common statistical procedures.

Surveys can ask teachers, school leaders, even students to report on what is happening or what they are doing in or out of the classroom. They can also report on their attitudes about a program. Over time, this information can be used to monitor the progress of a program. Surveys can also be used to measure outcomes. However, because surveys are students’ or teacher’ self-reports outcomes, they are often considered to be less reliable or accurate. Self-reporting of attitudes may be unreliable because respondents may report what they think they are supposed to say. Self-reports of the amount learned may be unreliable because respondents often over-estimate the amount that they learned. Reliability can be increased by asking the same question of multiple types of respondents. If principals, teachers, and students all report that students learned a specific skills, the results are more reliable than if only the student reported that finding.

Surveys can be combined with a comparative study design and the same questions can be asked of teachers or students participating in several programs or a new program and the traditional program.

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Again, such comparisons are particularly useful if you are considering multiple approach or treatment options.

Case Studies

Case studies collect much more-detailed information but, for practical purposes, they zero in on a much smaller sample of teachers, students, or classrooms. They often involve conducting interviews, collecting sample lesson plans and student products, and making observations in schools and classrooms, maybe even accompanied by video recordings for more detailed analysis later.

Case studies are most useful when you want process information, that is, when you want to examine not just results or self-reports of progress but observe how a program is being implemented in the class. This will give you information on how materials and technology are used, what it is that teachers and students are doing. These observations can tell you how accurately teachers are implementing the program—information that can allow you to make revisions and modifications.

The large quantity of detailed data from a case study is very difficult to analyze. Hours of classroom time takes hours to observe and many more hours to analyze. And it is often difficult to draw conclusions across cases. Furthermore, because such a small sample is used, however well-drawn, it is impossible to infer conclusions from this sample and make conclusions about the larger group. Also, because of the information is so detailed and it takes so much time to collect and analyze it, case studies are very expensive.

On the other hand, because they are so reflective of things that are happening in specific classrooms, case studies and particularly video recordings of good class sessions can be very useful as part of teacher training or shared best practices among teachers.

Comparative Study

A comparative study looks at the difference between two or more approaches. It is most useful when more than one approach is under consideration, although it is often used to compare a new approach with the current approach. Such studies are usually used with some direct measure of outcome, such as an assessment of teacher or student skills or knowledge. Comparative studies are often used early on in implementation with a small group of teachers, schools in a pilot test to help policymakers decide if full investment in a particular approach is warranted. It also gives you information that would allow you to fine tune the approach before full implementation. Using a comparative study allows you to say, with more or less confidence, that differences between groups are due to the approach or “treatment”, rather than some other consideration, such as pre-existing differences between the groups.

A comparative study can be “experimental” or “quasi-experimental”. With an experimental design, students, teachers, classes or schools are randomly assigned to one condition or the other. Ideally, all variables are controlled or held constant, except the treatments under consideration. This set of requirements is extremely difficult to follow in real world situations. These requirements also make experimental designs very expensive to implement. An alternative is a quasi-experimental design,
where a comparison is made but one requirement or another is not followed. This makes it much more difficult to attribute differences between the groups to the treatments, rather than to some other uncontrolled condition. For example, if students are not randomly assigned it could be said that one group scored higher than the other because the students in that group were more knowledgeable or capable to begin with and it had nothing to do with the treatment. Special care is taken with quasi-experimental designs to eliminate these “alternative” explanations. For example, you may want to not only measure student learning after their participation in the treatments but before, as well. If you compare some measure of student knowledge or capability before the study begins and you find that the groups score the same, then you can be more confident that any difference at the end of the study are not due to pre-existing capabilities or knowledge of the students. Another alternative possibility could be that students or teachers signed up for the new treatment or program and one could claim that it was their motivation to try something new that accounted for any differences. Consequently, the study should not allow for volunteers or if it does, should randomly pick participating teachers or schools from among the volunteers and use the others as the comparison group, perhaps allowing them to start their participation in a subsequent year.

But in any case, it is important to consider a treatment or approach as a “whole”. That is treatments in the real world (as opposed to the experimental laboratory) are often complex combinations of interventions, for example the use of computers AND new pedagogy AND teacher training. One cannot make the claim, even with experimental studies, that it was the computer that made the difference—it was the whole package of changes.

Comparative studies usually rely on direct measures of outcomes, such as assessments of student learning. As such, the data are relatively easy to collect and easy to analyze and report.

**Official Data**

In addition to these three evaluation approaches, another source of information of use to evaluators is official information that Ministries often collect. This may include enrollment figures, student attendance, teacher participation in workshops, curriculum standards, and student assessment scores. Because this data collection is across the entire system, the conclusions drawn are for the entire population. From the evaluator’s perspective, these data are inexpensive to collect and easy to analyze. As more and more instruction goes online, the data becomes more fine-grained. It may include the number of hours students spent interacting with online units, the number of discussion postings made, and scores on quizzes. Given the sheer amount of information that is collected online, it is sometimes more difficult to analyze this in a meaningful way.
Choosing the Design

The uses, advantages and disadvantages of the three types of designs can be summarized as follows:

<table>
<thead>
<tr>
<th></th>
<th>Uses</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| **Survey**       | Determine the extent to which an approach is being implemented and determine self-reported outcomes. | • Relatively inexpensive  
• Relatively easy to administer  
• Data are easy to analyze  
• Can infer results to entire population | • Subject to self-report biases and inaccuracies |
| **Case Study**   | Determine the ways in which a program is being implemented; identify best practices and needed changes. | • Data are rich and full of examples  
• Very useful for training and sharing of best practices  
• Allows you to examine in detail how program is being implemented | • Expensive  
• Time consuming  
• Cannot infer findings to larger group |
| **Comparative Study** | Determine the outcome or impact of two or more approaches or treatments. | • Allows you to compare the relative effectiveness among several options  
• Allows you to test out the effectiveness of an approach before making a full investment  
• Allows you to determine causality  
• Data are easy to analyze  
• You can infer findings to the entire population | • Expensive  
• Very difficult to implement |
Official Data

| Track participation and outcomes. | • Allows you to track participation, progress, and outcomes  
• Findings and conclusions relate to entire population  
• Automatically collected within the system  
• Inexpensive to collect  
• Because it is quantitative, data are usually easy to analyze | • Amount of data, especially electronically collected data, is sometimes difficult to analyze |

Now turn to the Jordanian Monitoring and Evaluation case study. Notice that there for each strategy and action, milestones and outcomes were specified. One or more methods for collecting and analyzing were also specified. There were three monitoring and evaluation methods used. One was a monitoring of achievable milestones using MoE records, including the analysis of data automatically generated by the Educational Management Information System (EMSS). We also used surveys of teachers and assessments of students. However, since all schools will ultimately implement the plan, there was not an alternative approach or treatment considered. So this was not an experimental study but a quasi-experimental study. The assessments are comparative in the sense that performance on schools that are implementing the plan earlier will be compared with those schools that will be implementing it later, or students in regular schools are compared to students in Lead Schools.

The Jordanian plan was a relatively low cost evaluation and monitoring strategy. Each strategy was evaluated but inexpensive methods were used: data routinely collected for MoE records, data collected automatically by the electronic management support system, and surveys. The more-expensive assessment measures were used sparingly and for a very specific purpose. The very expensive case study methodology was not used. We relied instead on surveys to examine and monitor process.
Developing Your Evaluation and Monitoring Plan

Following the Jordanian example, take your ICT strategy designed in Master Plan Development phase and for each strategy and action, fill in the following form:

<table>
<thead>
<tr>
<th>Strategy and Action</th>
<th>Milestones</th>
<th>Expected Results</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Action 1:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategy 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action 2:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategy 2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Action 1:</td>
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<td></td>
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<tr>
<td>(Etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional Resources


Phase: Evaluate and Adapt

Step: Monitor, Adapt, and Revise

Case Study of Planning an Evaluation: Jordan

As part of the ICT Plan and Strategy that we submitted to the Ministry of Education in Jordan, we recommended a series of monitoring and evaluation actions.

Monitoring and Evaluation Plan

Method. There were two purposes for the monitoring and evaluation plan: 1) monitor the implementation of the strategies and 2) evaluate their impact. There were three methods by which these two purposes could be achieved: 1) monitor milestone events using MoE data, including data embedded in the EMSS (Education Management Support System); 2) conduct surveys of teachers’ pedagogical practices and ICT use; and 3) assess student outcomes.

In the first case, specified progress and accomplishments would be compared to a schedule of specified milestone events. The data would be drawn from official MoE records related to teacher participation, computers deployed, etc. Also included here are reports generated from the EMSS, data automatically collected at no additional monitoring and evaluation cost. In the second case, a random or representative sample of principals, teachers and perhaps students would be surveyed annually to determine progress. These surveys would ask the teachers’ self-reports (with principal and even student cross-validation) of classroom pedagogical practices. These measures should be taken annually to chart progress towards goals. And in the third case, all students in certain grades, or a sample of them, would be annually assessed using the ICT-based NAFKE (National Assessment for the Knowledge Economy) to measure outcomes on student achievement. This is the instrument recommended in Strategy 4. Once developed, this instrument would be administered annually, as well. It should be administered in coordination with the teacher survey; that is, if a sample of students is drawn for the assessment (instead of an assessment of the entire population students) those students’ teachers should be included in the survey. This would allow for correlation between pedagogical practices, as reported by teachers, and student outcomes, as measured by the assessment.

The following table summarizes the milestones, expected results, method, and key indicators for each of the strategies and actions.

<table>
<thead>
<tr>
<th>Strategy and Action</th>
<th>Milestones</th>
<th>Expected Results</th>
<th>Method</th>
<th>Instrument and/or Key Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Action 1: Train all Teachers and principals in blended learning pedagogy. | 1. Blended pedagogy training materials developed  
2. Teachers and principals trained in blended learning pedagogy | 1. Materials developed  
2. Teachers trained in blended learning pedagogy | 1. MoE records  
2. MoE records | 1. Number of training units developed or purchased according to records  
2. % of teachers trained according to records |
| Strategy 1          |                                                                            |                                                                                  |                                                                       |                                                                                                                    |
| Action 2: Embed blended learning materials and assessments throughout the curriculum. | 1. Curriculum materials developed or purchased incorporating ICT and blended learning | 1. Materials developed  
2. Teachers using blended pedagogy materials regularly in classes | 1. MoE records  
2. Survey | 1. Number of digital materials developed or purchased; number of curricular standards addressed  
2. Teacher survey shows teachers self-report use of blended pedagogy |
| Strategy 1          |                                                                            |                                                                                  |                                                                       |                                                                                                                    |
| Action 3: Provide each teacher with a computer and high-speed internet. | 1. Teachers have easy access to computers and high-speed internet | 1. Technology deployed.  
2. Teachers use computers regularly to support blended pedagogy | 1. MoE records  
2. Survey | 1. % of teachers with computers, number of computers in labs, number of computers in regular classrooms, % of classrooms with computers  
2. Teacher survey shows teachers self-report regular use of computers |
| Strategy 2          |                                                                            |                                                                                  |                                                                       |                                                                                                                    |
| Action 1: Conduct information needs assessment. | 1. Information needs assessment conducted  
2. EMSS system modified to provide needed information | 1. Principals and teachers participate in needs assessment  
2. Changes in EMSS made | 1. MoE records  
2. MoE records | 1. Needs assessment completed and information needs identified  
2. Changes made |
| Strategy 2          |                                                                            |                                                                                  |                                                                       |                                                                                                                    |
| Action 2: Train all principals and teachers in the use of EMSS. | 1. Principals and teachers trained in EMSS  
2. Principals and teachers use EMSS regularly | 1. MoE staff, principals and teachers trained data-based decision making  
2. MoE staff, principals and teachers use EMIS regularly for decisions | 1. MoE records  
2. Survey | 1. % of principals and teacher trained.  
2. Principal and teacher self-report that they use EMSS to make decision and find it useful |
| Strategy 2          |                                                                            |                                                                                  |                                                                       |                                                                                                                    |
| Action 3: Assure that all principals and teachers have easy access to EMSS. | 1. Provide all principals with a networked computer  
2. Provide all teachers with a networked computer (see Strategy 1, Action 3) | 1. Principals have a networked computer at their desk  
2. (see Strategy 1, Action 3) | 1. MoE records  
2. (see Strategy 1, Action 3) | 1. % of principals with networked computers  
2. (see Strategy 1, Action 3) |
| Strategy 2          |                                                                            |                                                                                  |                                                                       |                                                                                                                    |
| Action 4: Require all schools to submit school-based ICT plans. | 1. School generated ICT plans | 1. ICT plan from each school | 1. MoE records | 1. % of schools that submitted an ICT plan |

**Summary of M&E Approach**
<table>
<thead>
<tr>
<th>Strategy 3</th>
<th>Action 1: Set up Lead Schools program.</th>
<th>1. Procedure and criteria for selecting Lead Schools developed; Lead Schools selected</th>
<th>1. Procedures developed</th>
<th>1. MoE records</th>
<th>1. Procedures developed</th>
<th>2. Number of schools applying for program and quality of applications</th>
<th>3. Number of schools selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 3</td>
<td>Action 2: Begin developing project-based training and materials.</td>
<td>1. Project-based pedagogical training materials developed or identified 2. Lead Schools principals and teachers trained in project-based pedagogy</td>
<td>1. Project-based materials developed 2. Principals and teachers trained in project-based pedagogy</td>
<td>1. MoE records</td>
<td>2. MoE records</td>
<td>1. Number of materials developed 2. % of Lead School principals and teachers trained</td>
<td></td>
</tr>
<tr>
<td>Strategy 4</td>
<td>Action 1: Develop and field test ICT-based assessments of knowledge economy skills.</td>
<td>1. ICT-based assessments of knowledge economy skills developed 2. ICT-based assessments administered</td>
<td>1. Assessment tasks developed 2. Students demonstrate mastery on knowledge economy skills</td>
<td>1. MoE records</td>
<td>2. Assessment scores</td>
<td>1. Assessment completed and field tested 2. % of students showing competence on ICT-based measures of knowledge economy skills</td>
<td></td>
</tr>
</tbody>
</table>
Phase: Evaluate and Adapt

Step: Measure Success

Exercise for Creating Success Measures

Goal
The goal of this exercise is to help you identify the metrics that you can use to measure the success of your policies and to identify areas where improvements can be made.

Resources
In addition to the exercise here, you have access to the Jordanian Case Study and the additional resources listed at the end of this material. You will also need the evaluation plan that you developed in the last exercise.

Output
As a result of this exercise, you will have a list of metrics for your measurable goals.

From Evaluation Plans to Metrics
The principal question here is, what evidence would stakeholders take that indicate your goals have been met? For each goal there are one or more measures or indicators that would be taken as evidence. Take the strategies and actions specified in the Master Plan Development phase and elaborated in your Evaluation and Monitoring Plan developed in the last exercise.

For each strategy and action, list metrics of success that you think would convince your stakeholders you have accomplished your goals:

In the area of professional development, teaching and learning: (e.g. number of teachers trained, teacher skill level increases, number and quality of teacher-generated materials increases, number of teachers collaborating on projects increases, teacher classroom behaviors changed; students more engaged, as measured by lower absence; student projects produced, student scores increased, etc.)
In the area of curriculum and assessment change: (e.g., curricular frameworks developed, standards specified, materials developed, new student skills acquired, rubrics developed, new assessment tasks designed, students assessed, etc.)

In the area of school policy, organization and management: (e.g., parent participation increases, outside volunteer or expert participation increases, number of student projects that incorporate outside experiences increases, student learning interactions or collaborations outside of class time increases, etc.)

In the deployment of technology and its integration in support of these changes: (e.g., deployment of computers and other technology increases, number of networked computers increases, virtual speed increases, availability of digital materials increases, etc.)

**Metrics for Measurable Goals**

Take a look at the Jordanian case. Notice that metrics for success were specified for each action the final year of the plan. Then progress measures were estimated for each subsequent year.

Now, for the year five of your evaluation plan, take the metrics for each of the strategies and actions above and complete the following table, extending your work for the evaluation plan from the previous exercise.

<table>
<thead>
<tr>
<th>Instrument and/or Key Metrics</th>
<th>Year 5</th>
<th>Year 4</th>
<th>Year 3</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal for Strategy 1; Action 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal for Strategy 1; Action 2</td>
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<tr>
<td>Etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Phase: Evaluate and Adapt

Step: Monitor, Adapt, Revise

Case Study of Selecting Metrics: Jordan

As part of the ICT Plan and Strategy that we submitted to the Ministry of Education in Jordan\(^4\), we worked with Ministry officials to select metrics and specify the levels of success for each. We stated what would constitute success by the end of the five-year effort and worked backwards to specify acceptable levels of progress at the end of each year.

<table>
<thead>
<tr>
<th>Instrument and/or Key Indicators</th>
<th>Year 5</th>
<th>Year 4</th>
<th>Year 3</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of training units developed or purchased according to records. 2. % of teachers trained according to records.</td>
<td>2. 100% of teachers and principals will have been trained in blended-learning pedagogy</td>
<td>2. 75% of teachers and principals will have been trained in blended-learning pedagogy</td>
<td>2. 50% of teachers and principals will have been trained in blended-learning pedagogy</td>
<td>2. 25% of teachers will have been trained in blended-learning pedagogy</td>
<td>1. UNESCO ICT teacher standards adopted and materials developed</td>
</tr>
<tr>
<td>1. Number of digital materials developed or purchased; number of curricular standards addressed. 2. Teacher survey shows teachers self-report use of blended pedagogy.</td>
<td>1. MoE will have identified or developed digital content for 100% of the curriculum; 70% of the teachers will have created digital content 2. 90% will use blended learning in one lesson per week, 70% in two or more lessons</td>
<td>1. MoE will have identified or developed content that implements blended learning in 80% of the curriculum 2. 75% will use blended pedagogy in 1 lesson per week, 50% in 2 or more lessons</td>
<td>1. MoE will have identified or developed content that implements blended learning in 60% of the curriculum 2. 50% will use blended pedagogy in 1 lesson per week, 25% in 2 or more lessons</td>
<td>1. MoE will have identified or developed content that implements blended learning in 40% of the curriculum 2. 25% will be using blended pedagogy in 1 lesson per week</td>
<td>1. MoE will have developed standards for blended learning curriculum materials and begin identifying or developing content</td>
</tr>
</tbody>
</table>

<p>| 1. % of teachers with computers, number of computers in labs, number of computers in regular classrooms, % of classrooms with computers. | 1. 70% of classrooms will have at least one networked computer; 80% of schools will have two or more computer labs; 100% of schools with have high speed connections 2. 90% will use blended learning in one lesson per week, 70% in two or more lessons | 1. 50% of classrooms will have at least one networked computer; 60% of schools will have two or more computer labs; 70% of schools with have high speed connections 2. 75% will use blended learning in one lesson per week, 50% in two or more lessons | 1. 30% of classrooms will have at least one networked computer; 40% of schools will have two or more computer labs; 75% of schools with have high speed connections 2. 50% will use blended learning in one lesson per week, 25% in two or more lessons | 1. 100% of teachers will have immediate access to a networked computer; 10% of classrooms will have at least one networked computer; 20% of schools will have two or more computer labs; 40% of schools with have high speed connections 2. 25% will use blended learning in one lesson per week |
| 1. Teacher survey shows teachers self-report regular use of computers. | 1. Needs assessment completed and information needs identified. 2. Changes made. | 1. 100% of principals and teachers trained. 2. Principals self-report that they use EMSS to make decision and find it useful. | 1. 75% of principals and teachers trained 2. 75% of principals will use EMSS to support school-based planning 1. 100% of principals will have access to a computer |
| 1. % of principals with networked computers. 2. (see Strategy 1, Action 3) | 1. % of schools that submitted an ICT plan. | 1. % of schools that submitted an ICT plan. 1. Procedures developed 2. Number of schools applying for program and quality of applications. 3. Number of schools selected. | 1. Competition held 2. At least 200 schools apply 3. Another 100 schools chosen | 1. Competition held 2. At least 200 schools apply 3. Another 100 schools chosen | 1. Competition held 2. At least 200 schools apply 3. 100 schools chosen 1. Procedures developed |</p>
<table>
<thead>
<tr>
<th>1. Number of materials developed.</th>
<th>1. MoE will have identified or developed content that implements project-based pedagogy for 20% of the curriculum.</th>
<th>1. MoE will develop standards for project-based curriculum materials.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. % of Lead School principals and teachers trained.</td>
<td>1. (not specified)</td>
<td>1. (not specified)</td>
</tr>
<tr>
<td></td>
<td>2. (not specified)</td>
<td>2. (not specified)</td>
</tr>
<tr>
<td></td>
<td>3. 80% of Lead School teachers will be using project-based pedagogy in one lesson per week; 50% two or more lessons</td>
<td>3. 50% of Lead School teachers will be using project-based pedagogy in one lesson per week; 350% two or more lessons</td>
</tr>
<tr>
<td>1. Number of proposals submitted.</td>
<td>1. Assessment completed and field tested.</td>
<td>1. Standard specified for knowledge economy skills assessment.</td>
</tr>
<tr>
<td>2. Resources deployed.</td>
<td>2. % of students showing competence on ICT-based measures of knowledge economy skills.</td>
<td>2. 35% of students taking the assessment will demonstrate mastery of knowledge economy skills; 60% of students in Lead Schools</td>
</tr>
<tr>
<td>3. % of teacher self-report that they are engaged in project-based innovative projects.</td>
<td>1. ICT-based assessment administered</td>
<td>1. ICT-based assessment developed and field tested</td>
</tr>
<tr>
<td>4. Number of innovations adopted by partner schools, according to school-provided evidence.</td>
<td>1. Assessment completed and field tested.</td>
<td>1. Standard specified for knowledge economy skills assessment.</td>
</tr>
</tbody>
</table>
Phase: Evaluate and Adapt

Step: Recommend Change

Guidelines and Exercise for Recommending Change

Goal
Continuous monitoring and periodic evaluation will provide managers with the information needed to make improvements in the current plan and inform subsequent plans. The goal of this exercise is to plan a data collection schedule that will allow you to monitor results and make changes, if necessary.

Resources
In addition to this exercise, you should have your evaluation plan developed earlier in this phase.

Output
At the end of this unit, you will have a schedule for collecting data that will allow you to review progress and make changes to keep you moving toward your goals and vision.

Planning for Change
In the case of Jordan, it was recommended that the Steering Committee for the ICT plan review progress monthly in the first year and quarterly in subsequent years. Since the Steering Committee is to be composed of leaders from all of the affected directorates as well as outside, non-voting members, it would be in a position to not only monitor progress but identify and implement needed changes early in the process.

In the case of Singapore, the MoE schedules periodic reviews throughout its master plans. They collected information annually and report the results. Mid-way through the five-year plan they had an international review panel examine the evaluation reports and recommend changes in the plan. In the final year of a five-year plan, a summative review involves an international review panel that is charged with examining the findings across the years of the project. Based on these reviews, the international review panel makes recommendations for the next master plan.

As you finalize your plan, list a schedule of periodic reviews:

List the areas which you anticipate may need to be changed or tuned during the first years of the project: