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Program Theory as a Tool for Program Design
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Session Chair: Charles H Gasper [Senior Consultant - TCC Group]
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Time: Oct 27, 2016 (03:00 PM - 04:30 PM)
Room: A703

Abstract 1 Title: Assumptions of program design-towards a typology
Presentation Abstract 1:

One barrier to viable program evaluations is that development programs are based on assumptions that often are not well articulated. In designing programs, stakeholders often lack clear outlines for how implemented interventions will bring desired changes. This lack of clarity masks critical risks to program success and makes it challenging to evaluate such programs. The conversation on examining program assumptions needs to start with a typology that clarifies various categories of assumptions, and differentiate those that are worth examining from those that are not.I propose and illustrate a typology of five critial program assumptions-normative, diagnostic, prescriptive, causal, and external assumptions. I suggest a method for mainstreaming assumptions' inquiry in the broader evaluation design.

Abstract 2 Title: Contributions of Evaluation Tools to Program Design: lessons learned from the application of logic models and the action model/change model schema to a large-scale education program
Presentation Abstract 2:

When evaluators are invited to join a program design team, logic models and the action model/change model schema are useful tools to bring to the table. However, information regarding relative strengths and limitations of their use is lacking. The proposed paper will discuss lessons learned from a comparative study that separately applied both approaches to designing a large-scale education program in Taiwan. Only contributions to program design are discussed here. The main merit of logic models was identifying program components and suggesting indicators for progress monitoring and evaluation. Logic models proved relatively easy to learn and follow by stakeholders. The action/change model schema identified additional components such as contextual factors and mechanisms producing individual or organizational changes, although it took longer to master. The findings from this study provide evaluators a basis for selecting either approach or both to design future programs.

Audience Level: All Audiences
Session Abstract:

Program Theory as a Tool for Program Design

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Contributions of Evaluation Tools to Program Design: lessons learned from the application of logic models and the action model/change model schema to a large-scale education program

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Introduction

There is an increasing interest for stakeholders to ask assistance from evaluators to clarify or describe major components and elements of an intervention program, for enhancing the quality of the program plan and for better communication and implementation. The demands have been responded to by the evaluation community. For instance, *program design* is the theme of American Evaluation Association's 2016 Annual Evaluation Meetings. With the increasing interest in program planning, it is important for evaluators to examine and discuss the existing planning/evaluation models for further advancement and dissemination.

Among the planning/evaluation models, logic models have been the most popular tool for evaluators to assist stakeholders in describing an intervention program and/or guiding evaluation activities (Julian, Jones, & Deyo, 1995; Kaplan & Garrett, 2005; Knowlton & Phillips, 2009; McLaughlin & Jordan, 1999; Renger & Hurley, 2006; Sabatier, 1999). Government agencies such as the Center of Disease Control and Prevention (CDC, 1999), and private foundations such as the United Ways of American (United Way of America., 1996) and W.K. Kellogg Foundation (W.K. Kellogg Foundation., 2005) require grantees to include a logic model in proposals. Recently, addition tools such as causal loop diagrams (Midgley, C., 2003; Senge, 2006) and the action model/change model schema (Chen, 2005, 2015) are gaining momentum as alternative planning/evaluation models. These planning/evaluation models have been individually introduced and discussed in the literature. Potential users need to know the relative strengths and limitations of these models in order to make an informed decision on which one to use in their programs. This information, however, is currently not available in literature.

We attempt to start narrowing this information gap. Because of reasons such as time and resource constraints, this study focused on comparing logic models and the action model/change model schema by applying them in planning a large-scale education initiative, called the Learning Community Program, in Taiwan. This study intended to provide information on empirical experiences of applying, as well as examining relative strengths and limitations of the two models. The rest of this article will:

- Introduce the background of the Learning Community Program
- Discuss the methodology used in this comparative case study
- Discuss the logic model and its application experiences
- Discuss the action model/change model schema and its application experiences
- Discuss relative strengths and limitations of these two models

Theoretical Foundation of Learning Community and its Application in Taiwan

Theoretical Foundation of Learning Community and its Movement

The notion behind learning community is to facilitate a group of people who share common academic goals and attitudes, who meet regularly, shares expertise, and works collaboratively to improve teaching skills and the academic performance of students (Spillane & Camburn, 2006). Many studies (Beatriz, Deborah, & Hunter, 2008; Drew, 2014; Robinson, Lloyd, & Rowe, 2008) provided evidence that implementing learning community in schools could have potential benefits for revitalizing school teaching and to better prepare student competence for the future.

The literature indicate student leaning is not a standalone activity, but it is closely connected with organizational conditions (Robinson et al., 2008). School leadership can improve learning by supporting and developing teacher quality, defining goals, measuring progress, strategically managing resources, and collaborating with external partners (Beatriz et al., 2008). Learning community uses broad-based learning to create the necessary ecology for schools to become self-creation agencies in which relationships among people are interconnected (Pan, 2014). It consists of five key features: shared values and vision, collective responsibility, reflective professional inquiry, and the promotion of group as well as individual learning.

Furthermore, Sato (2012), a Japanese scholar, who integrated western theories and local practices, proposed the 'learning community' as an approach to transform schools. Building collegiality among teachers, as well as constructing the classrooms as learning communities are the two main tasks. Teacher collegiality is featured as a cycle of teachers working together to plan the lesson; conducting the lesson with one teacher teaching and others observing; and discussing the lesson taught based on the data collected (Drew, 2014). Learning community emphasizes leadership, community building and teacher development as points of inquiry and reflection. It is the responsibility of teachers to establish a situation for dialogue and to encourage peer collaboration. Based upon the above principles the idea of learning community could be implemented at school, teacher, and/or student level. Regardless which level, participants need to be willing to share, reflect, dialogue, and cooperate to enhance performance. Teachers are motivated by the premise of power sharing and democratic decision making in learning processes. The concept of learning community is so appealing to educators that many countries including Taiwan have adopted it as education reform.

The Learning Community Program in Taiwan

'Learning community' (xue xi gong tong ti 學習共同體), an approach integrating Japanese practices introduced by Sato (2012), has become a buzz word in Taiwanese schools in the last few

years, and has been tried out in several counties/cities. Based upon the theoretical foundation discussed above, an indigenous model, the Program of *Learning Community under the Leadership for Learning* (referred to as *The Learning Community Program* in the article) was developed in Taiwan for implementation purposes. Funded by the Ministry of Education, the Program was launched from 2013. Currently, there are 33 schools enrolled (15 of them are primary schools) and a total of 692 teachers and 9,037 students participating in the Learning Community Program. The project office coordinating the program is located at the Graduate Institute of Educational Policy and Leadership at Tamkang University. Because of the dynamic and intricacy of the program, stakeholders were interested to learn if evaluators have tools which could help them clarify the relationship between various components of the program, improve communication and development of the program, as well as guide future evaluations. The authors proposed a comparative study by using logic models and the action/change model schema, to which the stakeholders agreed.

Methodology of the Study

Planning/evaluation models such as logic model or the action model/change model schema are typically developed by a team of evaluators and stakeholders (Chen, 2015). During the development process, evaluators usually play a role of facilitator, by helping stakeholders to clarifying and/or articulating their view and the assumptions of the intervention program, especially major components and their relationships. In this study, the team developing the logic model and the schema for the Learning Community Program consisted of three types of members: Key stakeholders, internal evaluator/stakeholder, and external evaluator. Key stakeholders were those who were responsible for implementing the Learning Community Program and conducting research on program effects. The internal evaluator/stakeholder was a professor with dual roles: planning and evaluating the program. For convenience, she will be called *the internal evaluator* in the rest of the article. The *external evaluator* provided consultation and technical assistance to key stakeholders and to the internal evaluator during the development processes.

The research procedures used in this study consisted of the following three phases:

<u>Phase I (Developing the Logic Model)</u>:

In Phase I, the internal evaluator would invite key stakeholders to a working group meeting, where she would introduce the conceptual framework of logic models to key stakeholders. Together, they would develop a logic model for the Learning Community Program. The external evaluator would provide technical assistance during the development process.

<u>Phase II (Developing the Action Model/Change Model Schema)</u>:

In the second phase, evaluators and stakeholders would use the same procedures to develop the action model/change model schema for the Learning Community Program, with assistance from the external evaluator.

Phase III (Lessons Learned from these applications):

After completion of the logic model and of the action model/change model schema, the internal evaluator and stakeholders would be invited to a focus group meeting to discuss their views and experiences with applying the logic model and the action model/change model schema, as well as relative strengths and limitations of logic models and the schema. The discussions in the meeting would be recorded and transcribed.

The data were analyzed using the qualitative content analysis approach (Krippendorff, 1980). These phases are discussed in details in the rest of the article.

Phase I: Developing the Logic Model of the Learning Community Program

Phase I consists of two steps: 1). Introducing logic models to stakeholders; and 2). Developing the logic model for the program.

Introducing Logic Models to Stakeholders

In the first working group meeting, internal evaluator introduced logic models to stakeholders. The introduction applied the version of logic models provided by the United Way of America (1996), most widely applied by evaluators. The introduction covered the components and elements of logic models as follows:

(1) *Inputs* (i.e., resources dedicated to or consumed by the program), (2) *Activities* (i.e., what the program does with the inputs to fulfill its mission), (3) *Outputs* (i.e., the direct products of program activities), and (4) *Outcomes* (i.e., benefits to participants during and after program activities). The table of a logic model includes arrows connecting *Inputs* to *Activities*, *Activities* to *Outputs*, and *Outputs* to *Outcomes*. If it is necessary, the *Outcomes* component can be further divided into short-term and long-term outcomes or short-term, intermediate, and long-term outcomes.

Developing the Logic Model for the Community Learning Program

After the introduction, internal evaluator facilitated stakeholders to develop a draft of logic model of the Learning Community Program. The development process went smoothly with the exception of stakeholders' inquiry regarding differences between *outputs* and *outcomes*. With the internal evaluator's assistance, stakeholders were able to understand that *outputs* are direct products of activities (such as number of classes, number of participants in each class, etc.),

while *outcomes* are measures of program goals. The first draft of the logic model was developed in the working group meeting and revised in a subsequent meeting. The final version of the logic model for the Learning Community Program was as follows:

Inputs:

The inputs component included the following elements: materials that they would need (i.e. brochures, handbooks, films, instruments), as well as necessary funding and staffing.

Activities:

The activities component included partnerships with other educational institutions and governments, and providing training to the teachers and school administrators.

Outputs:

The outputs component included the number of schools, teachers, administrators, alliances, and mentor on-site visits.

Outcomes:

The outcomes component consists of three levels: School, teacher, and student. The school-level outcomes included cultural changes in shared leadership, vision, and solidarity. The teacher-level outcomes included teacher enthusiasm and efficacy. The student-level outcomes included increasing collaboration and expression.

The logic model is illustrated as in Table 1.

Table 1 about here

Applying the Action Model/Change Model Schema to Conceptualizing the Learning Community Program (Phase II of the Study)

After the completion of the logic model, the project moved to Phase II. The same group of internal evaluator and key stakeholders of Phase I participated in another working group meeting to develop the action model/change model schema for the Learning Community Program. This phase also consists of two steps: 1). Introducing the action model/change model schema to stakeholders; and 2). Developing the schema of the program.

Introducing the Action Model/Change Model Schema

The internal evaluators started the working group with an introduction of the concepts of action model and change model and how they are relevant to an intervention program (Chen, 2005, 2015). These two models and their relationships are discussed as follow:

Action Model

An action model deals with actions which must be taken in order to support the intervention in producing desirable changes. An action model is a systematic plan for arranging staff, resources, settings, and support organizations to reach a target group and to deliver intervention services. The action model consists of (1) *Implementing Organization* (i.e. ensure capabilities, resource allocation, activity coordination recruitment, training, and maintain competency and commitment) (2) *Program Implementers* (i.e. counselors, case managers, outreach workers, school teachers, health experts, and social workers). (3) *Peer Organizations/Community Partners (*i.e. establish collaborations) (4) *Intervention and Service Delivery Protocols* (i.e. curriculum of the intervention stating the exact nature and content of activities, and service delivery protocols as steps to be taken to deliver the intervention to clients in the field.) (5) *Ecological Context* (i.e. involvement of a supportive environment, micro-level and macro-level) (6) *Target Group* (i.e. establish eligibility criteria for clients' recruitment).

Change Model

A change model refers to casual mechanisms and contextual factors that generate changes. A change model describes the causal process generated by the program. The elements of a change model consist of the following three elements (1) *Goals and Outcomes* (i.e. goals are a desire to fulfill unmet needs; outcomes are concrete, measurable aspects of goals) (2) *Determinants* (i.e. a mechanisms by which an intervention produces outcomes). (3) *Intervention* (i.e. activities that directly change a determinant)**.** The change model (or theory of change) has been extensively discussed in theory-driven evaluation literature (Donaldson, 2007; Fulbright-Anderson, et al., 1998; Weiss, 1998).

Relationships between the Action Model and Change Model

Relationships among the components are illustrated in Figure 1:

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Figure 1 about here

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Figure 1 indicates that the action model must be implemented appropriately to activate the "transformation" process in the change model. For a program to be effective, the action model must be sound and the change model plausible; the implementation of the program is then also likely to be doing very well. Figure 1 also illustrates evaluation feedback as represented in

dotted arrows. Information from implementation can be used to improve the planning or the development of the action model. Similarly, information from the change model can be used to improve the implementation process and the action model.

Because of many new concepts, the internal evaluator spent more time to introduce the schema than logic model to stakeholders.

Developing the Action Model/Change Model Schema

The second step of Phase II was for stakeholders and internal evaluator to develop the schema for the Learning Community Program in the working group meeting. As described in the previous section, the development of the logic model of the program was straightforward and smooth; however, this was not the case in the development of the schema. The development team immediately realized the development of schema required them to wrestle with the complicated and dynamic issues inherited in the program. For examples, the following two issues were intensively discussed in the meeting:

Implementers versus target population

Initially, stakeholders and the internal evaluator identified the following two groups as *Implementers***: (**1) project staff and consultants and (2) school administrators and teachers. The reason was that both groups needed to be trained to deliver services. However, after further discussion, they felt that these two groups were trained to do different services: Project staff and consultants were trained to have the capacity to be trainers and mentors for school administrators and teachers. The later were trained on knowledge and skills to apply the learning community in schools and classrooms. Thus the program was operating under the principles of the Training-the-Trainers Model. That is, the project office first trained the staff and consultants as trainers of the leaning community, whom in turn trained administrators and teachers to practice the learning community at schools. With this insight, the meeting participants classified project staff and consultants under the category of implementers; and school administrators and teachers under the category of target populations. School administrators and teachers would become implementers after they were trained to practice the learning community. Their new roles would be described in the section of the change model.

Describing the interventions and change processes

The action model/change model schema requires users to clearly identify the interventions and their causal processes for attaining outcomes. Since the Learning Community Program consisted of three levels of interventions (schools, teachers, and students), the participants had intensively discussed how to better reflect these causal processes in a change model. The discussions focused on the following two options:

Option 1

Option 1 was to create a change model that included three levels of interventions in a diagram similar to the change model illustrated in Figure 1. In the change model, each intervention had its own causal process and outcomes.

Option 2

Option 2 was to create three change models representing three levels of interventions. This option expanded Figure 1 from one to three change models.

During the discussions, participants felt that Option 1 would not reflect well the relationships across different levels of change processes. For example, literature indicates the school-level changes must take place first in order to support changes at teacher-level; and teacher-level change must happen before student-level change can occur. Option 1 would have difficulties in fully reflect these change processes. After consulted with the external evaluator, they decided to adopt Option 2. As will be discussed in the next section, Option 2 could clearly illustrate that the school-level change model was a necessary condition that made the teacher-level change model and student-level change model possible.

After an additional working group meeting, stakeholders, internal evaluator, and external evaluator were able to agree on a final version of the action model/change model schema for the Learning Community Program as illustrated in Figure 2.

Figure 2 about here

Figure 2 indicates the components of the action model and change models and their relationships as below:

Action Model:

Implementing Organization:

The project office was established for coordinating program activities, such as hiring personnel, establishing partnerships, coordinating activities, and developing the intervention protocol.

Implementers:

Implementers were staff and consultants responsible for training and mentoring school administrators and teachers.

Associate Organizations/Partners:

The project office then began building partnerships with universities, government agencies, and schools. This was intended to help support the planning and implementation of the program.

Ecological Context:

The project office and partners launched campaigns to promote the Learning Community Program via conferences and media to create a milieu for supporting the program.

Intervention and Service Delivery Protocols:

The project office and partners then developed models to help adapt the notion of learning community to become an indigenous model and protocol for Taiwanese culture. Adaptation of the program made application more feasible in Taiwanese schools and communities.

Target Populations:

The project office with the assistance of partners was then responsible for recruiting schools and teachers to participate in the program.

Change Model:

The implementation of the action model expected to generate three change processes: school-level, teacher-level and student-level. Each level was comprised of three components; intervention, determinants, and outcomes. The three levels of change models were as follows:

School-Level:

Intervention**:** Trained and mentored school administrators for school-level interventions

Determinants: Increased administrators' competency and capability in initiating and practicing learning communities in their respective schools.

Outcomes: Administrators would create structural and policy changes for supporting the learning community activities in schools, in order to increase school solidarity and increase innovative curriculum and instruction.

Teacher-Level:

Intervention: Trained and mentored teachers for practicing learning communities

Determinants: Increased teachers' skills, knowledge, and commitment for practicing learning communities

Outcomes**:** Increased dialogues, collaboration, and experience sharing among teachers and increased capacity for professional development.

Student-Level:

Interventions: Conducted learning-centered teachings in classrooms

Determinants: Increased students' engagement in inquiry, collaboration, and expression, as well as improved social interactions and relations in classes.

Outcomes: Increased students' engagement in learning, enhanced learning power, and enhanced academic performance

Relationships among three levels

Figure 2 indicates that three levels of the intervention were related: The school-level of change had to be achieved first in order to support the teacher-level of change. Furthermore, both, school-level change model and teacher-level change model must take place before the student-level change model would work.

Impacts of the programs

Figure 2 also indicates these three-levels of changes would create the following overall impacts: improving student achievement and career after graduation, increasing the number of school adopting learning communities, and contributing to improving government education policies.

Phase III: Comparing Relative Strengths and Limitations of Two Models

The Phase III of the study was for the key stakeholders and internal evaluator to attend a focus group meeting to discuss their views on relative strengths and limitations of logic models and the action model/change model schema based upon their experiences. The participants in the meeting stated that both logic models and the schema are useful tools for evaluators to assist stakeholders in describing and/or strengthening the program plan. Furthermore, they indicated that each model has strengths and limitations. They stated that logic models have a strength for effectively identifying major components and elements of a program. For example, they liked that logic models provided an effective strategy for identifying major components and arranging them in a sequential order on one page, making it very convenient for discussions. Logic models also helped them identify indicators for monitoring the program. All stakeholders found logic models relatively easy to learn and apply.

However, stakeholders and the internal evaluator indicated that logic models have an important limitation: they do not sufficiently reflect the dynamic relationship between different components of the program and their theoretical links. They thought that logic models lump together different types of elements into one component such as activities or inputs. This strategy can haze these elements' unique functions in a program. For example, in the Learning Community Program, the *activities component* included elements of partnership, capacity building, and intervention under the same category, although each served a different purpose for the program.

One limitation reported for the action model/change model schema by stakeholders and the internal evaluator was the time and effort invested to learn and apply the schema, beyond that required by logic models. However, after they mastered the concepts, they felt that the conceptual framework of the schema better captured what their program intended to deliver and accomplish. Furthermore, they thought that the structure and components of the schema inspired

them to discuss theoretical and practical issues which were not even considered before. They felt the schema provided more insights for understanding their program, and more ideas for how to strengthen the program plan.

Conclusions and Discussions

This case study provides first-hand information on experiences for applying logic models and the action model/change model schema in planning the Learning Community Program in Taiwan. In general, key stakeholders and internal evaluator reported that both models were useful tools for assisting them in clarifying major components of a program and strengthening their program plan. In addition, this study provides empirical information on relative strengths and limitations of these two models. This information is useful for further disseminating these two models. According to key stakeholders and the internal evaluator's experiences, logic models as proposed by the United Way of America (United Way of America., 1996) have the following merits:

1) Components of logic models are easy to understand and apply to programs
2) Logic models are very useful for identifying major components of the program
3) Output components are useful for monitoring the progress

However, they also indicated that logic models have the following limitations:

1) Filling in the four components of the logic model (input, activities, outputs, outcomes) does not capture the complicated relationship between program components and program levels
2) Logic models do not allow to illustrate the multi-level nature of a program sufficiently
3) Logic models do not identify theoretical issues that explain why programs works

Similarly, stakeholders and the internal evaluator reported the following strengths and limitations of the action model/change model schema:

Strengths:

1) Schema addresses issues that are important to real-world practice
2) Schema provides insights for better understanding the theoretical foundation of the program
3) Schema provides guidance for strengthening program plan and/or evaluation design in greater details

Limitations:

1) It is more challenging to understand the newer concepts provided by the schema
2) It takes more time and effort to apply the schema and to fully answer the necessary questions

The above information will benefit future dissemination of these planning/evaluation models. Potential users may want to consider this information when selecting a model that better fits their situation and need for improving planning process or guiding evaluation activities. Alternatively, they could use both for their program as demonstrated in this study. This study is the first to apply both models discussed in this paper, successfully and fruitfully. Stakeholders recognized the merits of both models. Developing a logic model first, to become familiar with what a planning/evaluation model looks like, made it easier but worthwhile for stakeholders to learn and apply the action model/change model schema afterwards. This experience enhanced their capacity to apply these models to better understand the intricate nature of a real world program.

Furthermore, this study promotes the advancement of the action model/change model schema by providing concrete evidence that supports the contribution and usefulness of the schema with multiple change models, and how they better address complex issues within a program. The authors are challenging other evaluators to apply the action model/change model schema for addressing multiple levels or complicated issues within their intervention programs in the future.

Table 1: Logic Model of the Community Learning Program

INPUT →	ACTIVITIES →	OUTPUTS →	OUTCOMES
• Fund • Project staff • Background information on learning community/leadership for learning • Materials /equipment (brochure, handbooks, films, instruments)	• Build a trilateral partnership of the university, local governments and participating schools • Organize learning community/leadership for learning meetings/workshops with local governments and schools for generating support • Provide training to participating schools and teachers on learning community/leadership for learning • Develop indigenous models and strategies of learning community/leadership for learning • Provide consultation to participating schools through on-site visit • Enhance the coordination of relevant programs at the local government level • Reinforce policies at the local government level to facilitate the realization of the project • Build schools as learning communities • Construct teacher learning community by lesson study (a cycle of teachers working together to plan the lesson; conducting the lesson with one teacher teaching and others observing; and discussing the lesson taught based on the data collected) • Conduct classrooms as learning communities by exerting learning-centered teaching (involving students' engagement of inquiry, collaboration and expression)	• Number of schools participating in the project, • Number of teachers participating in the project, number of students participating in the projects, • Number of subjects using the approach of learning community • Number of school strategic alliances • Number of teacher communities across schools • Number of teacher web communities • Number of consultants' on-site visit of participating schools	• **School-level outcome:** ○school as learning community (supportive and shared leadership, vision and recognition, learning for change, shared personal practice) ○school capacity for development(the solidarity of school members, the innovation of curriculum and instruction, and the enthusiasm of teacher engagement in teaching and learning) • **Teacher-level outcome:** ○ learning-centered teaching practices ○ teacher professional learning ○ teacher efficacy • **Student-level outcome**: ○ students' competence of inquiry, collaboration and expression ○ the changes of the social relations in class ○ students' engagement of learning ○ students' learning power

Figure 1: Action Model/Change Model Schema

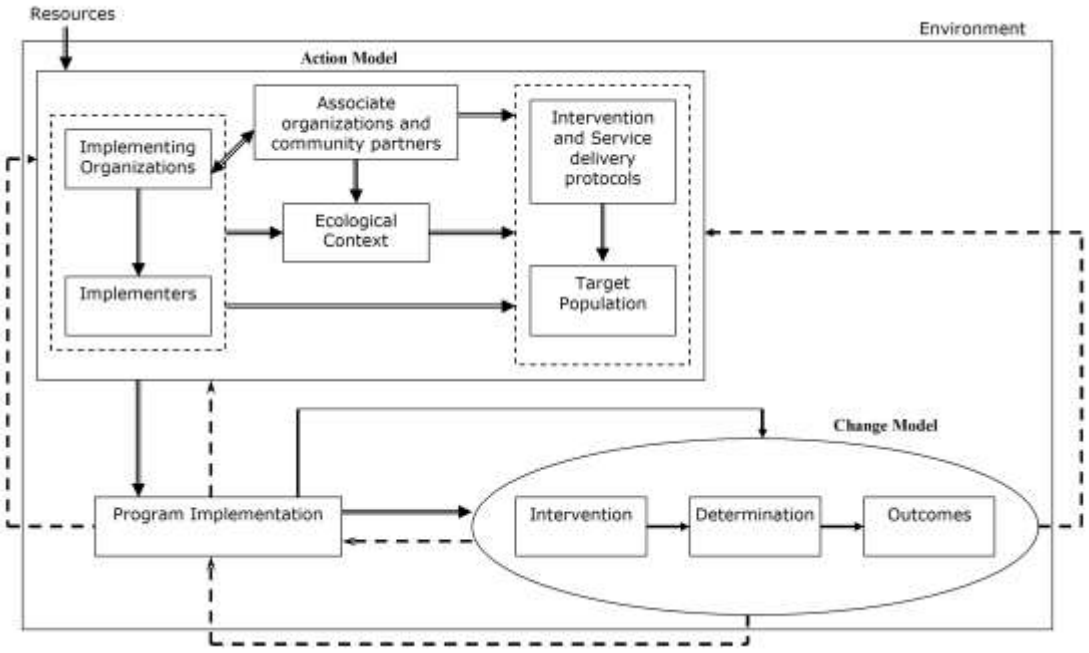
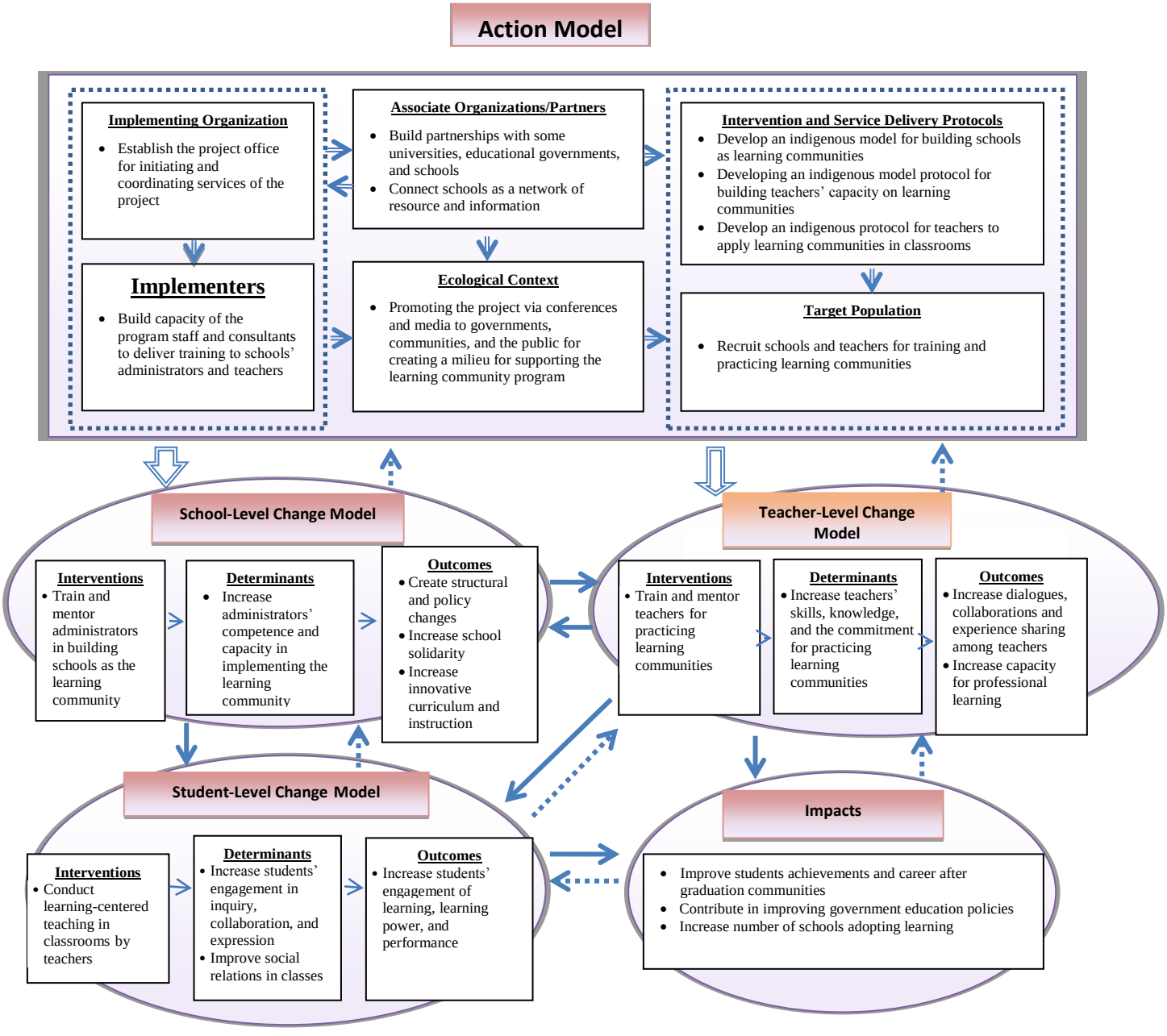


Figure 2 Action Model/Change Model of the Learning Community Program



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