INSTRUCTIONAL PROCEDURES
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INQUIRY MODEL

Content Compiled and Adapted
By Nada Salem Abisamra

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LESSON PLAN

By Nada Salem Abisamra

CONTENT

INTRODUCTION

As the stream of time takes us inexorably toward a new century, many people are beginning to question the direction the stream is taking us.
Voices, both inside education and outside it, are heard demanding more efficient "teacher production."

There is great emphasis nowadays on interactive , cooperative and collaborative learning in which we emphasize each person's voice , create an atmosphere of democracy where all opinions are heard , all perspectives are valued , and finally where we build an atmosphere of community, a classroom community .

Parents as well as teachers would like to see collaboration as the core of the curriculum. In fact, it's not just collaboration as core, it's ***collaborative inquiry*** *which includes problem-solving activities that promote negotiation of solutions in group situations and whose focus should be less on arriving at a correct solution than on generating different viable solutions.*
It seems that collaborative inquiry is being implemented in a variety of creative ways and it has been embraced as an important position to take as we move toward the 21st Century.
By using collaborative inquiry our goal is to make an impact on the social structure and culture of our country , since we educate critical, pro-active, and reflective agents of change.

Inquiry-based learning , hands-on experimenting , solving real problems and encouraging critical thinking are becoming important in succeeding in the work world ;

Finally we can say that
Consideration, creativity, responsibility, participation ,
all these things seem to become involved in the coming century , as does the suggestion of stretching the student's experience beyond individual knowing to a kind of collaborative wisdom.

We Have to Teach Students to

* Think critically and logically to make relationships between evidence and explanations
* Develop descriptions, explanations, predictions and models using evidence
* Revise explanations based on logic and evidence
* Communicate and defend explanations and procedures
* Identify questions that can be pursued through investigation
* Use appropriate tools, techniques, and technologies to analyze data
* Design and conduct investigations
* Recognize and analyze alternatives , explanations and predictions

SO our aim is to encourage a number of important dispositions in students ; we want them to

* Become collaborative learners, capable of working together to solve problems.
* Learn critical thinking skills, such as problem identification.
* Apply knowledge and connect to prior learning.
* Realize the relevance of their learning experiences.
* Learn to assume responsibility for their own learning.

So that , over time, they become more self-directed learners.

New Classroom Culture

The classroom is the workplace.

*The **process** of learning--not just what we learn--is important.*

*The focus of our work is upon a **long-term** design project.*

*Curriculum incorporates **content, processes**, and products.*

Assessments evaluate students' new understandings

*We celebrate ourselves in our work, our classroom, and our **community**.*

*The teacher is the **mentor** and the **facilitator** of learning.*

*The student is a novice , **learning to be an expert.***

*Interactivity, such as **cooperative** and **collaborative** learning is essential.*

CURRICULUM INQUIRY CYCLE

"It is teachers who, in the end, will change the world of the classroom by understanding it."
Lawrence Stenhouse

Assumptions Underlying the Curriculum Inquiry Cycle :

1. Teachers are knowledgeable professionals.
2. Planning curriculum is the professional responsibility of teachers.
3. Curriculum inquiry is a vehicle for professional growth.
4. Curriculum inquiry leads to improved learning and teaching.
5. Teachers learn by building on current practice.
6. Teachers need to share professional expertise.
7. Curriculum planning is a team effort.
8. Curriculum Inquiry strengthens close connections among curriculum, instruction and assessment.
9. Curriculum planning is a recursive process.
10. The classroom is the fundamental unit of school change.
11. Administrative support is essential for effective curricular and instructional change.

Curriculum inquiry improves the core of educational practice, since it involves teachers in determining the critical experiences necessary to engage students in meeting challenging standards.
This is more than an instructional innovation. Through inquiry, teachers plan learning environments that provide and build on essential conditions for student learning. This process helps teachers develop and articulate local standards which guide their teaching in the context of broad state and national reform priorities.
It addresses such fundamental questions as:
What knowledge is crucial?
What do we understand about this knowledge?
What strategies are most powerful for fostering student learning?
What critical experiences must occur to achieve standards?
What forms of collaboration are necessary to provide coherence and meaning in teaching and learning?
How do we study our classrooms and communicate our understandings to others?

Educators participating in this ongoing cycle of curriculum renewal should examine current curriculum practice in the schools ; clarify local needs, content and performance standards to determine how to balance competing demands; plan critical classroom experiences to achieve desired student goals; and conduct classroom research on the selected practices in action, assessing progress and making needed changes.
We should all work to tailor a long term comprehensive curriculum change effort which utilizes this unique and valuable process.

A major goal should be to assist teachers and schools to create self-sustaining processes for improving curriculum and instruction.

Critical questions that may be addressed:

1- ***Examining Current Practice***

- *What does my teaching look like?*
- *Why do I work this way?*
- *What does this tell me about how I think about curriculum?*
- *Is my current practice making a difference in student learning?*

2- ***Making Decisions***

- *Are my practices consistent with what is known about how people learn?*
- *Are content and performance standards reflected in my teaching practice?*
- *Am I aware of alternative models of teaching?*

3- ***Creating an Optimal Learning Environment***

- *What are the dynamics of an optimal learning environment?*
- *What learning experiences are essential?*
- *What assessments are appropriate?*

4- ***Expanding Teacher Knowledge through Classroom Research***

- *What dilemmas, questions or concerns about teaching and learning do I want to explore?*
- *How can I collaborate more with colleagues?*
- *How will I share my research?*

Insights into Inquiry-Based Teaching

The worlds of inquiry, curiosity, and wonder should be alive in classrooms everywhere.
It is a world where children's minds come alive with possibilities and where students learn through experience, investigation, and hands-on activities that engage their minds and foster their interest.

And inquiry-based teaching is a perfect complement to a child's natural curiosity about the world and how it works. "Whether it is the elementary student's wonder that is prompted by a story about hibernating animals, the middle school student's predictions about the relationship between circumference and diameter that arise from an exploration of different-sized spheres, or the high school student's questions that are provoked by a local environmental issue, students become actively engaged in the learning process when given the opportunity to hypothesize and investigate .

Inquiry is central to both mathematics and science. For example, inquiry-oriented instruction in science engages students in the investigative nature of the world around them, and inquiry-based strategies involve activities and skills that focus on the active search for knowledge or understanding. And mathematics is much more than arithmetic and algorithms. Instead, it involves data, measurements, and recognition of patterns.

An inquiry-based classroom recognizes the diverse needs of students and employs the research-based strategies that help to keep all students engaged in learning.
It is a community of inquiry where students and teachers share responsibility for learning, and where they collaborate on constructing new knowledge.
"Students have significant input into just about every aspect of their learning—how their classroom is set up, how time is structured, which resources are used, which topics are explored, how investigations will proceed, and how findings are reported . No longer are teachers the sole purveyors of knowledge and students passive receptacles.

Strategies used by exemplary mathematics and science teachers ensure that activities are set up to allow students to be physically and mentally involved in the academic subjects. Activities are based on the use of materials to investigate questions and solve problems. Evidence is mounting that indicates that inquiry-based instruction improves student attitude and achievement, facilitates student understanding, fosters critical thinking skills, and facilitates mathematical discovery.

Inquiry Strategies for Science and Mathematics Learning also provide guidelines for creating an inquiry-based classroom that provides students with the time, space, resources, and safety necessary for learning.

An inquiry-based classroom:

Engages students in designing the learning environment.

Integrates science laboratories into the regular class day.

Uses inquiry in the mathematics classroom .

Employs management strategies to facilitate inquiry.

Reflects the nature of inquiry by displaying and demanding respect for diverse ideas, abilities, and experiences; modeling and emphasizing the skills, attitudes , and values of scientific inquiry: wonder, curiosity, and respect toward nature; enables students to have a significant voice in decisions about the content and context of their work; and nurtures collaboration among students

INQUIRY

We use INQUIRY to investigate problems .

Our first entry into the effort is to recognize a problem. There after we must construct our design as to how we are going to attack the problem and attempt to solve it.
We may not solve the problem within the given time frame and what we do may raise other associated problems. That is okay. Any good research does the same.

Basic structure of inquiry :

WHAT DO WE KNOW?
WHAT DO WE NEED TO KNOW?
HOW CAN WE FIND IT OUT?

The steps to follow are :

1. Identifying/Presenting the PROBLEM we are attempting to solve.

2. Forming HYPOTHESES : tentative solutions to the problem that can be verified with data .

3. DATA gathering
   This may include:
   a. Observation notes
   b. Pictures
   c. Drawings and diagrams
   d. Recordings (audio or video)

4. DATA analysis

5. GENERALIZING + Closure

The Suchman Inquiry technique

In the classroom, occasions frequently arise in which students come across unusual phenomena.

Each of these occasions, and many others like them, provide the teacher with rich opportunities to encourage students to carefully analyze the situation and to hypothesize and test explanations. These situations make it difficult for students to remain indifferent - they demand explanations and want to know why.

Robert Suchman *developed a strategy, similar to the game "twenty questions", to teach students a process for investigating and explaining unexpected and surprising events.*

Overview of the strategy:

A. Students are confronted with a puzzling situation.

It is important that the explanation of the event should be based on ideas with which the students already have some familiarity - the explanation of the situation should be discoverable.

B. Students form hypotheses *(possible solutions)*

The number of hypotheses should be small enough so that students can see to which hypothesis their data relate .

C. Students ask the teacher questions : Data gathering

These must be of a form which can be answered by a ***"yes"*** *or a* ***"no"****. For example, a student may not ask "What is inside the radiometer?" but may ask "Is there air inside the radiometer?"*
If a question isn't answerable by "yes" or "no" , the students are asked to ***rephrase*** *it .*
Moreover , the questions must be worded so that the answer could be obtained through ***observation*** *alone .*

The strategy eliminates all open ended questions and forces students to ***focus their ideas*** *and to develop questions which are, in effect, limited hypotheses.*

With practice, students should be encouraged to structure their inquiry so that they ask questions which analyze the situation they have observed - trying to find out what things are made of , what actually happened , before they consider relationships between the variables involved in the situation.

It is important that students learn to distinguish between:

* ***Questions which are fact gathering,***
  and
* ***Questions which experiment with the relationships between the variables involved in the situation.***

Questions such as:

"Is the strip made of metal?"
"Is there a vacuum inside the radiometer?"

help to clarify the situation which has been ***observed*** *or* ***described****, whereas questions such as:*

"If the soldiers had run rather than marched would the bridge still have collapsed?"

seek to explore the relationships between some of the variables involved in their situations.

C. *Assessing hypotheses*

It is important that in this stage, the teacher and the students remember that even after lengthy questioning, a number of satisfactory explanations may be possible and that students should be encouraged to explore a range of alternative hypotheses.

D. *Generalizations + Reflection and analysis of the process.*

The final stage of the strategy involves students examining the process they have worked through - considering the stages of the process and the effectiveness of the different questions which have been asked.

Finally ,

There should not be too much emphasis on "getting the right answer" - rather students should be encouraged to see that there are a number of satisfactory explanations in many situations.

Lesson Plan
Suchman Inquiry Model

1- Planning the Lesson :

1.1 Goals

a - Content :

Students will recognize the need for applying appropriate essay rules in their writing .

b - Process :

Students will form hypotheses .

They will gather data : by asking questions which require only 'yes' or 'no' answers (based on observation only , i.e. not conclusion)

They will assess hypotheses based on data .

They will reach a conclusion .

1.2 Problem

Sally and Cynthia are two students in Mrs. Salem's 9th grade English class .They each wrote an essay of about 250 words on "Passive Resistance" . Both had good ideas and expressed themselves accurately (Grammar and vocabulary wise).

However , Cynthia received an "A" while Sally got a "C" ; Why should there have been such a big difference between their grades ?

1.3 Prerequisite Knowledge

Rules of Paragraph Writing .

2 - Implementing the Lesson

[I would like first to mention a few things :

Subject	= English as a Third Language
Topic	= Essay Writing
Grade Level	= 9
Time Required	= 50 minutes
Number of students	= 18]

2.1 Presenting the problem

- "Good morning everyone , how are you today ? Are you ready to start the lesson ?"
- "Yes miss !"said the students all together .
- " Excellent ! Then let's start ……

As you recall , we have been studying the rules of paragraph writing for a while now ; today I would like to see if you can apply our background in solving a problem .
So , the goal for today's lesson is to examine and solve the following problem .

The teacher displays the following information to her class on an overhead .##

> "Sally and Cynthia are two students in Mrs. Salem's 9th grade English class .They each wrote an essay of about 250 words on "Passive Resistance" . Both had good ideas and expressed themselves accurately . However , Cynthia received an "A" while Sally got a "C" ; Why should there have been such a big difference between their grades ?

2.2 Forming Hypotheses

So , let me remind you a little bit of the way this lesson should be conducted .
We have a problem here and we are trying to solve it . This means you have to start offering what ?
-"Tentative solutions , miss ," said Ralph proudly .
- Excellent , Ralph , so…
- "I know why Sally had a bad grade," said Judith shyly .
- "Why , Judith ?"
- "Because maybe she didn't draw an outline for the essay before she wrote it ."
- " Good , Judith , and why do you think an outline is useful ?"
- "Because it helps us to have a good organization," rushed Mark.
- "We must have an Introduction , a Body and a Conclusion ," added Carol .
- "Good everyone , then this is our first hypothesis ; let me write it on the chalkboard ." (And she writes : No Outline)
"Any other hypotheses ?
- "There might have been no unity and coherence in her paragraphs," answered Marcel .
- "Excellent Marcel , so this is our second hypothesis . (And she writes it on the board)
- "Miss, what about the topic sentence that needs supporting sentences and then a concluding sentence ?" asked Hanady hesitantly .
- "Good point , Hanady , so what would you like me to write on the board ?"
- "Maybe that she didn't follow the rules of paragraph writing ?"
- "O.K. Hanady , come and write it on the board ."

2.3 Gathering Data

- "So we have three hypotheses now , who knows what the next step will be ?"
- "We have to observe and gather data ," said Eric .
- "But what are we going to observe ? We have no facts !" exclaimed a number of students in unison .
- "Eric has a point , but it's just that instead of really observing , we'll imagine we had the two essays in front of us , and the way we'll make our observations is for you to ask me questions , and your questions , together with my responses , will give you your data .
Now , do you know anything about these questions you'll ask ?"
- "But if you answer our questions you will be solving the problem yourself !" said Marcel .
- "Good remark , Marcel , so , to avoid that , what is the kind of questions you will be allowed to ask ?"
- "I don't really know , but you shouldn't give us conclusions ," answered Marcel .
- "Aren't they 'yes' or 'no' questions ?" asked Melissa .
- "That's it , Melissa , excellent .
"Now that we know the kind of questions you have to ask , let's go back to our hypotheses and begin gathering some data to try and determine what to accept , modify or reject .
Then they all studied the statements on the board and did some thinking for a few seconds .##
- " Did Sally have an introduction , a body and a conclusion in her essay ?" asked Hanady .
- "Yes , she did ," answered the teacher.
Then she wrote Hanady's question on the board and put Y next to it
- "Are there unity and coherence in her paragraphs ? asked Tarek
- "Is it appropriate for me to answer this question , Tarek ?"
- "It requires a conclusion , how can you answer it , then ?" said Tania .
- "O.K. Tarek , then you need to reword it to make it observable ."

- "Did she use transition words to link her paragraphs ?" tried Tarek .
- "No she didn't ."
Then the teacher wrote Tarek's question on the board with an N next to it .##
- "Was there one idea only in each paragraph ?" asked Sonia .
- "No ."
And again the teacher wrote that on the board .
- "What about Cynthia's essay , was there one idea in each paragraph ?" asked Sonia .
- "Yes ."
- "And did she use transition words ?"
- "Yes ."
The teacher wrote the questions on the board with their answers.
- "Did Cynthia have an introduction , a body and a conclusion ?"
- "Yes , she did ."

2.4 Assessing Hypotheses

- "O.K. , class , now let's compare what we have with our hypotheses . What can we conclude ?"
- "Our first hypothesis is wrong miss !" exclaimed a few students all together .
- "Hey there , be careful , can we ever say our hypothesis is wrong ?"
- "We don't use the idea of right or wrong , because when we gave it we didn't know anything about the facts we know now ," answered July proudly .
- "We just reject the hypothesis ," said Aileen .
- "Good Aileen , because the evidence we have seems to detract from the hypothesis .
- "Why do you want to reject the first hypothesis ?"
- "Because she must have drawn an outline since she had an introduction , a body and a conclusion ; her essay was well organized ," said Caline .
- "What about our second hypothesis ?"

- "This one must be correct , because if we compare to two essays , we notice that in Cynthia's there were unity and coherence while in Sally's there weren't any ," said Hady .
- "Why don't we rephrase our last two hypotheses to put them both in one since they are almost the same ?" said Sonia .
- "How is that ?"
- "Yes, she's right ; if we have in each paragraph one topic sentence only it means we have unity ," rejoined Hady .
- "What about coherence ?"
- "We have to find a way to include it too ," Marcel said .

2.5 Closure

- "O.K. , then let's have another look at the two hypotheses and at the questions and answers we have . What can we deduce ?"
- "It has something to do with following the paragraph rules every time we write something to explain ,"said Manal .
- "Then if we follow the paragraph or essay rules appropriately we will have good marks ," said Tarek .
- "Provided that your ideas and language are good ," rejoined the teacher . " So , what will our conclusion be ?"
- "Every time we have to write an essay we have to follow its rules, mainly those of unity , coherence and organization ," said Marcel .
- "Excellent , Marcel , then we can say now that we have reached the goals of this lesson . I'm so proud of the way youve all reasoned ."

3- Assessing Student Learning :

Individual Test : Case Study

" When the Japanese go on strike their production figures go up while when the Americans go on strike their production figures go down . Why should there be such a relevant difference between the two ?"
You have to provide tentative hypotheses and data-gathering questions .

LESSON PLANNING PROCEDURES

Time - we only have so much of it. The effective teacher cannot create a single extra second of the day - any more than anyone can. But the effective teacher certainly controls the way time is used.
Effective teachers systematically and carefully plan for productive use of instructional time.

One of the primary roles that we perform as a teacher is that of designer and implementor of instruction.
Teachers at every level prepare plans that aid in the organization and delivery of their daily lessons. These plans vary widely in the style and degree of specificity.
Some instructors prefer to construct elaborate , detailed and impeccably typed outlines; others rely on the briefest of notes handwritten on scratch-pads or on the backs of discarded envelopes.
Regardless of the format, all teachers need to make wise decisions about the strategies and methods they will employ to help students move systematically toward learner goals.

Teachers need more than a vague, or even a precise, notion of educational goals and objectives to be able to sequence these objectives or to be proficient in the skills and knowledge of a particular discipline.

The effective teacher also needs to develop a plan to provide direction toward the attainment of the selected objectives.
The more organized a teacher is, the more effective the teaching, and thus the learning, is .

Writing daily lesson plans is a large part in being organized.

Planning and classroom delivery innovations usually come once we are in the classroom with our own set of learners, have developed our own instructional resources, and have experimented with various strategies.
Although fundamental lesson-planning elements tend to remain stable, their basic formula is always modified to suit the individual teacher's lesson preparation or style of presentation.

The lesson plan is a dreaded part of instructions that most teachers detest. It nevertheless provides a guide for managing the learning environment and is essential if a substitute teacher is to be effective and efficient.

Three stages of lesson planning follow;

Stage 1: Pre-Lesson Preparation

1. *Goals*
2. *Content*
3. *Student entry level*

Stage 2: Lesson Planning and Implementation

1. *Unit title*
2. *Instructional goals*
3. *Objectives*
4. *Rationale*
5. *Content*
6. *Instructional procedures*
7. *Evaluation procedures*
8. *Materials*

Stage 3: Post-Lesson Activities

1.Lesson evaluation and revision

Lesson planning involves much more than making arbitrary decisions about "what I'm going to teach today."

Many activities precede the process of designing and implementing a lesson plan.
Similarly, the job of systematic lesson planning is not complete until after the instructor has assessed both the learner's attainment of the anticipated outcomes and effectiveness of the lesson in leading learners to these outcomes.

One final word, even teachers who develop highly structured and detailed plans rarely adhere to them in lock-step fashion.
Such rigidity would probably hinder, rather than help, the teaching learning process.
The elements of the lesson plan should be thought of as guiding principles to be applied as aids, but not blueprints, to systematic instruction. Precise preparation must allow for flexible delivery.
During the actual classroom interaction, the instructor needs to make adaptations and to add artistry to each lesson plan and classroom delivery.

DAILY LESSON PLAN FORMAT

*Teacher*_____

Course Title _____

1. ***Unit***_____

2. ***Instructional goal*** *(outcome that students should achieve on completion of the total unit of instruction)*

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3. ***Performance objectives*** *(skill defined as behavioral objective-action verb that is measurable)*

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4. ***Rationale*** *(brief justification of why we feel the students need to learn this topic)*

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5. ***Content****: (what is to be taught)*

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6. *Instructional procedures*

(a) Focusing event (something to get the students' attention)

(b) Teaching procedures (methods we shall use)

(c) Formative check (progress checks throughout the lesson)

(d) Student Participation (how we shall get the students to participate)

(e) Closure (how we shall end the lesson)

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7. *Evaluation procedures* (how we shall measure if the material has been learned)

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8. *Materials and aids* (what we shall need in order to teach this lesson)
