Course: Lab Organization, Management & Safety Methods (8629)
Semester: Spring, 2021
ASSIGNMENT No. 2

Q.1 Conduct a survey to find the aims and objectives of Sciences laboratories in Pakistan.

- Leading laboratory experiences is a demanding task requiring teachers to have sophisticated knowledge of science content and process, how students learn science, assessment of students' learning, and how to design instruction to support the multiple goals of science education.
- Pre-service education and in-service professional development for science teachers rarely address laboratory experiences and do not provide teachers with the knowledge and skills needed to lead laboratory experiences.
- There are promising examples of teacher professional development focused on laboratory experiences. Further research is needed to inform design of professional development that can effectively support improvements in teachers' laboratory instruction.
- School administrators play a critical role in supporting the successful integration of laboratory experiences in high school science by providing improved approaches to professional development and adequate time for teacher planning and implementation of laboratory experiences.

Teachers do not have sole responsibility for carrying out laboratory experiences that are designed with clear learning outcomes in mind, thoughtfully sequenced into the flow of classroom science instruction, integrating the learning of science content and process, and incorporating ongoing student reflection and discussion, as suggested by the research. Science teachers' behavior in the classroom is influenced by the science curriculum, educational standards, and other factors, such as time constraints and the availability of facilities and supplies. Among these factors, curriculum has a strong influence on teaching strategies. There are curricula that integrate laboratory experiences into the stream of instruction and follow the other instructional design principles. To date, however, few high schools have adopted such research-based science curricula, and many teachers and school administrators are unaware of them. Playing this critical role requires that teachers know much more than how to set up equipment, carry out procedures, and manage students' physical activities. Teachers must consider how to select curriculum that integrates laboratory experiences into the stream of instruction and how to select individual laboratory activities that will fit most appropriately into their science classes. They must consider how to clearly communicate the learning goals of the laboratory experience to their students. They must address the challenge of helping students to simultaneously develop scientific reasoning, master science subject matter and progress toward the other goals of laboratory experiences. They must guide and focus ongoing discussion and reflection with individuals, laboratory groups, and the entire class. At the same time, teachers must address logistical and practical concerns, such as obtaining and storing supplies and maintaining laboratory safety.

Teachers require several types of knowledge to succeed in these multiple activities, including (1) science content knowledge, (2) pedagogical content knowledge, (3) general pedagogical knowledge, and (4) knowledge of appropriate assessment techniques to measure student learning in laboratory education.

Pedagogical content knowledge can help teachers and curriculum developers identify attainable science learning goals, an essential step toward designing laboratory experiences with clear learning goals in mind. For example, in developing the Computers as Learning Partners science curriculum unit, Linn and colleagues researched how well models of thermodynamics at various levels of abstraction supported students' learning. They found that a heat-flow model was better able to connect to middle school students' knowledge about heat and temperature than a molecular-kinetic model. Linn describes aspects of the model as pragmatic principles of heat that are "more accessible goals than the microscopic view of heat that is commonly taught". The research team focused the curriculum on helping students understand these principles, including flow principles, rate principles, total heat flow principles, and an integration principle. It is commonly recognised that practical work has a distinctive and central role in science teaching and learning. Although a large number of studies have addressed the definitions, typologies, and purposes of practical work, few have consulted practicing science teachers. This study explored science teachers' perceptions of experimentation for the purpose of restructuring school practical work in view of science practice. Qualitative interviews were conducted with 87 science teachers at the secondary school level. In the interviews, science teachers were asked to make a comparison between students' experiments and scientific experiments. Eight dimensions of experimentation were generated from the qualitative data analysis, and the distributions of these eight dimensions between the two types of experiments were compared and analyzed.

Q.2 Defined controlled exercises. Write advantages and disadvantages of controlled exercises.

An exercise characterized by the imposition of constraints on some or all of the participating units by planning a uthorities with the principal intention of provoking types of interaction. See also free play exercise.

Controlled practice activities refer to activities that are restricted in nature where the focus is on developing accuracy rather than fluency. They usually include:

- Repetition
- Scaffolding
- Specific Target Language Focus

The specific target language focus can be from any of the three main system types i.e. vocabulary, grammar, and functions (also, spelling and pronunciation).

What controlled practices are NOT:

- Receptive (reading or listening) comprehension questions
- Guided Discovery Activities
- Noticing Activities
- Freer Productive Activities

Note: Although controlled practice activities might appear similar in form to some receptive comprehension questions, guided discovery, and noticing activities – i.e. multiple choice or matching activities – they have a different focus and goal.

In regards to freer practice, freer practice activities are focused on fluency rather than accuracy and are less-restricted than controlled practice ones**.** The relationship is as follows:

Table: Controlled and Freer Practice

Controlled Practice: **More Restricted**		**Freer Practice:** **Less Restricted**
< ———————————————————————— >		
Accuracy		**Fluency**

Within controlled practice, there is a range of restrictiveness.

Table: Controlled Practice

Controlled Practice Activities		
< ———————————————————————— >		
Completely Restricted		**Somewhat Restricted**

Usually, practice tends to go from more restricted to less restricted if there are more than one controlled practice in a lesson – i.e. if you are using the Test-Teach-Test method (you can see the page 'lesson frameworks' for more details) leading into a freer practice towards the end.

Controlled Practice Examples:

The following examples are roughly organized from being more restricted to less restricted:

Drilling

Drilling refers to an oral repetition of specific TL. Drilling can be mechanical – without much context – or meaningful – within a specific context. Ideally, the drilling should be meaningful; however, many popular language teaching programs such as Duolingo and Rosetto Stone rely heavily on mechanical drilling.

Activity Examples:

- Model & Drill: Teacher or video/audio clip models TL example, and the students repeat.
- Picture Passing: Students pass pictures or visual stimulus around and need to form some kind of TL example from it i.e. students pass a pictures of different people with different physical appearances and need to say: "This person has brown hair" [then they get handed a new picture] "This person has blue-eyes" then continue

passing down pictures and saying "This person has ____" (the blank being whatever physical features the picture has).

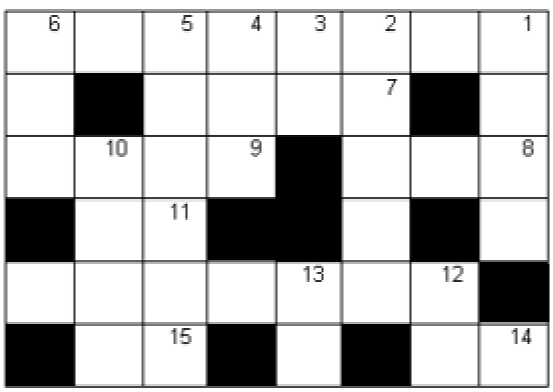
Bingo

Students get handed a sheet of different vocabulary items, sounds, or grammar points and the students try and get bingo (a horizontal, vertical, or diagonal line) on their worksheet based on what the teacher calls out.

For example:

- Vocabulary: Teacher reads out the word, definition, or a clue (i.e. "This animal goes 'mooooo') for each of the vocabulary words on the sheet (i.e. Cow).
- Pronunciation: Teacher reads out different words and students have to mark off which word they hear on their sheets – note that the words should be chosen strategically i.e. minimal pairs (words that only have one sound difference e.g. ship and sheep) with specific sounds that the students have trouble pronouncing.
- Grammar: Teacher reads out a sentence and students have to mark which grammar point corresponds with the sentence i.e. I have been to Spain = Present Perfect.

Crosswords



For example, clue number six/down: An animal that goes "Moooo"; A: Cow. They are another way to provide controlled practice and can be used for grammar (i.e. Clue: I have been to Spain; A: Present Perfect), and functions (i.e. Clue: A phrase used to order food; A: Can I get…).

Activity Examples:

- Individually: Students individually work on crossword and then check with a partner their answers before doing whole class feedback.
- Group/Pairs: Students work in pairs/groups doing crossword puzzles together.
- Information Gap: One student has half of the crossword puzzle answers and the other student has the other half. One student has to give clues for the answers (without being too direct of course: think ICQ!) and the other has to guess the answer from the clues. Then switch roles.

Here's a link to a crossword puzzle generator here.

Matching

Refers to any activity where students match one item with another.

Activity Examples:

- Definitions: Matching definitions with corresponding word, phrase, or even grammatical meaning.
- Synonyms/Antonyms: Matching a word/phrase to a synonym (i.e. terrible/bad) or antonym (terrible/great).
- Formality: Match word/phrase to its informal or formal equivalent i.e. I would like…/I want…
- Politeness: Match word/phrase to its more polite or less polite equivalent i.e. Would you give me../Give me…
- Visuals: Matching visuals with a language item i.e. a word/phrase/grammatical structure to a picture or series of pictures.
- Card Games: Students play memory matching game by turning over cards that are face down trying to find corresponding matches i.e. a word and a picture.

Fly Swatters/Touch the Board

Students are equipped with a fly swatter – or just simply use their hands – and the first student that swats or touches the correct answer on the white board wins.

Activity Examples:

- In Groups: Students are seated in groups and play the game amongst themselves as one student calls out the clue and the other students (perhaps two at a time) compete in swatting/slapping the correct answer first i.e. one student calls out: "An animal that goes"moo", and the first one to swat a cow amongst the pictures of various animals wins.
- Whole Class: Students form two lines leading up to the white board. The two students in front face away from the whiteboard as the teacher reads out the clue. When the teacher says "Turn around!" or "Go!" the students compete in swatting/touching the correct answer that is posted on the WB first (out of a number of options).

Winner Stays Standing

Two students stand up from their classroom seats, the teacher reads out/shows a clue, the first student to answer correctly 'stays standing' while the other one sits down, then another student stands up to take the place of the previous round's loser and then play again. Whoever answers accurately the quickest gets to keep standing.

- Images: Teacher flashes images one-at-a-time that represent the target language vocabulary for the lesson i.e. a picture of a cow.
- Read a Clue: Teacher reads a clue i.e. This animal goes, "Mooooo."

Fill-in-the-Blank

Fill-in-the-blank refers to an activity where there is a block of text – either in sentence or paragraph form – with blanks in them. The students have to write or choose the correct answer to fill in the blank.

Activity Examples:

- Two Options: Next to the gap there are two possible answers to choose from i.e. I ____ (went/have been) to the store yesterday. Students circle the correct option.

- Word Bank: Students have a word bank (either with the same number of words/phrases as there are blanks – or for more challenge more words than there are blanks), and they need to choose the correct word/phrase to fill in the blank.
- No Options: Students are presented a text (either in sentence-by-sentence or paragraph form) with blanks and the students have to produce the correct answer.

Q.3 Keeping in view the world related sequencing gives at least four examples from science practical in all three types.

The first principle for sequencing content they call "world related"—the content structure reflects the empirical relationships among events, people, and things. Subtypes here include sequences based on spatial relations, temporal relations, and physical attributes. The second principle is "concept related," in which sequences reflect the organization of the conceptual world. Thus one subtype of concept-related sequences is "logical prerequisite"—when it is logically necessary to understand the first concept in order to understand the second. "Inquiry-related" sequences are those that sequence the curriculum in relation to a particular method of inquiry, such as Dewey's analysis of the problem-solving process. "Learningrelated" sequences draw from knowledge of the psychology of learning in making decisions about sequence; thus sequencing decisions based upon such assumptions as "begin with content of intrinsic interest" or "start with the easiest skills" are learning related in nature. The final principle, "utilization related," sequences learning in relation to three possible contexts for utilization—social, personal, and career. As Posner and Strike point out, these categories can be considered as a set of concepts that should be useful to the curriculum developer, the curriculum evaluator, and the curriculum researcher.

Many different sequencing strategies have been proposed. Posner and Strike suggest that five types of organizing principles may be combined to create instructional sequences. The five organizing principles are:

1. World-related sequences — the consistency and relationships among phenomena as they exist in the world;
2. Conceptual-related sequences — the organization of the conceptual world as it relates to the real world;
3. Inquiry-related sequences — "those that derive from the nature of the process of generating, discovering or verifying knowledge";
4. Learning-related sequences — based on knowledge about the psychology of learning; and
5. Utilization-related sequences — either through procedural sequences for problem solving or based on the utilization potential of the content.

It begins when an issue, concern, or problem needs to be addressed. If education or training a segment of the population will help solve the problem, then curriculum to support an educational effort becomes a priority with human and financial resources allocated. The next step is to form a curriculum develop-ment team. The team

makes systematic decisions about the target audience (learner characteristics), intended out-comes (objectives), content, methods, and evaluation strategies. With input from the curriculum development team, draft curriculum products are developed, tested, evaluated, and redesigned -if necessary. When the final product is produced, volunteer training is conducted. The model shows a circular process where volunteer training provides feedback for new materials or revisions to the existing curriculum. The need for curriculum development usually emerges from a concern about a major issue or problem of one or more target audience. This section explores some of the questions that need to be addressed to define the issue and to develop a statement that will guide the selection of the members of a curriculum development team. The issue statement also serves to broadly identify, the scope (what will be included) of the curriculum content. There are two phases in the needs assessment process. The first is procedures for conducting a needs assessment. A number of techniques are aimed toward learning what is needed and by whom relative to the identified issue. Techniques covered in this section include: KAP - Knowledge, Attitude, and Practice Survey; focus groups; and environmental scanning. Analysis, the second part of this needs assessment step, describes techniques on how to use the data and the results of the information gathered. Included are: ways to identify gaps between knowledge and practice; trends emerging from the data; a process to prioritize needs; and identification of the characteristics of the target audience. Once the issue is defined, the curriculum team is formed, the needs assessed, analyzed and prioritized, the next step is to refine and restate the issue, if needed, and develop the intended outcomes or educational objectives. An intended outcome states what the learner will be able to do as a result of participating in the curriculum activities. The next challenge in the curriculum development process is selecting content that will make a real difference in the lives of the learner and ultimately society as a whole. At this point, the primary questions are: "If the intended outcome is to be attained, what will the learner need to know? What knowledge, skills, attitudes, and behaviours will need to be acquired and practiced?" The scope (breadth of knowledge, skills, attitudes, and behaviours) and the sequence (order) of the content are also discussed. Intended outcomes of population education with content topics is provided in the Addendum section as an example and application of how intended outcomes are linked with content. After the content is selected, the next step is to design activities (learning experiences) to help the learner achieve appropriate intended outcomes. An experiential learning model and it's components (i.e., experience, share, process, generalize, and apply) are discussed in this section.
Additional topics include:

1. learning styles and activities appropriate for each style;
2. a list of types of activities (with descriptions);
3. an activity design worksheet for facilitators; and
4. brief discussions on learning environments and delivery modes.

Now that the team has extracted the information and identified the learner, it is time to begin developing the content. Before designing the content, there needs to be clear objectives. Clear objectives include action words such as:

- Identify
- Modify
- Plan
- Evaluate

As the instructional designers create the objectives, they carefully connect them to the content. The objectives are measurable, which ensures that learning outcomes can occur. The team examines the environment in which the content will be used. They ask questions such as: will the learners be accessing the material on their mobile phones or in a classroom? The team plans how to sequence the content and what delivery method to use. They perform research, search for appropriate materials, and decide what graphics to use. The final step of the curriculum development process is evaluation. Although the material has gone through multiple iterations, it is evaluated once more. You could say that step four is present throughout each of the prior steps. Each team member from the beginning is constantly evaluating the material and ensuring that it serves the learner well. For example, the curriculum developer makes sure to match the learning objectives against the material to ensure that the material will lead to measurable results. The project manager tracks all team members' changes and ensures that they incorporate all necessary edits and revisions. It takes a team to design excellent curriculum. Each step involves collaboration and constant iterations of the material. As a result of this teamwork and dedication to the learner, it is possible to build curriculum that leads to desired learning outcomes. This section includes: (1) a definition of intended outcomes, (2) the components of intended outcomes (condition, performance, and standards), (3) examples of intended outcomes, and (4) an overview of learning behaviors. A more complete explanation of the types and levels of learning behaviours is included in the Addendum as well as intended outcome examples from FAO population education materials.

Q.4 Develop descriptive feedback sheet for the following experiments:

i. To measure the volume of a solid cylinder by measuring length and diameter of a solid cylinder with Vernier Calipers.

1. Volume of the cylinder V = $\pi r^2 l \ cm^3$,

V= volume of cylinder, r = radius of cylinder l = length of cylinder.

2.Least count of vernier calipers L.C = $\frac{S}{N}$ cm,

S = value of 1 Main scale division , N = Number of vernier divisions.

3.Length (or) diameter of Cylinder = Main scale reading (a) cm + (n*L.C) cm.

n = vernier coincidence .

Procedure : First we have to determine the least count count of the given vernier calipers.

To determine the volume of the cylinder we have to determine a)the length of the cylinder and b) radius of the cylinder and substituting these values in the equation for the volume of the cylinder we can calculate it.

a) To determine the length of the cylinder: Given cylinder is held gently between jaws 1,1 of the vernier calipers.The reading on the main scale just before the zero of the vernier is noted.This is called Main scale reading (M.S.R).The number of division (n) on the vernier which coincides perfectly with any one of the main scale divisions is noted.This is called vernier coincidence (V.C).The vernier coincidence (V.C=n) is multiplied by least count to get the fraction of a main scale division.This is added to the main scale reading (M.S.R) to total reading or total length of the cylinder.

Total reading = M.S.R + ($V.C \times L.C$)

Take the readings,keeping the cylinders between jaws 1,1 at different positions.Post the values of M.S.R and vernier coincidence (n) in the table.Take at least 5 readings, get the average of these 5 readings which is mean length(l)of the cylinder.

b)To determine the diameter of the cylinder : Place the cylinder diametrically between the jaws 1,1 of the vernier calipers, as in the above case post the values of M.S.R and vernier coincidence (n) in the table. Take at least 5 readings, calculate the average of these readings which gives the mean diameter (d=2r) of the cylinder.

c) To determine the volume of the cylinder :Substituting the values of mean length (l) of the cylinder and mean diameter (r) of the cylinder which is already determined, in the formula V = $\pi r^2 l cm^3$.

Determine Least count of vernier calipers : From the given vernier calipers

S= Length of Main scale division = 1 mm = 0.1 cm,

N = Number of vernier scale divisions = 10 ,

Substitute these values in the formula of Least count L.C = $\frac{S}{N}$ = $\frac{0.1}{10}$ =0.01 cm.

Table – Length of the cylinder :

S.No	M.S.R acm	Vernier Coincidence (n)	Fraction b=n*L.C	Total Reading (a+b) cm
1.	2.6	9	0.09	2.69
2.	2.7	1	0.01	2.71
3.	2.7	2	0.02	2.72
4.	2.7	2	0.02	2.72
5.	2.6	8	0.08	2.68

Average length of the cylinder l = $\frac{2.69+2.71+2.72+2.72+2.68}{5}$ cm= $\frac{13.52}{5}$ = 2.70 cm

b) Diameter of the cylinder :

S.No	M.S.R acm	Vernier Coincidence (n)	Fraction b=n*L.C	Total Reading (a+b) cm
1.	1.4	5	0.05	1.45

2.	1.4	4	0.04	1.44
3.	1.4	6	0.06	1.46
4.	1.4	5	0.05	1.45
5.	1.4	6	0.06	1.46

Average diameter of the cylinder d = 2r = $\frac{1.45+1.44+1.46+1.45+1.46}{5}$ cm= $\frac{7.26}{5}$ = 1.45 cm,

Average radius of the cylinder r =$\frac{d}{2}$ =$\frac{1.45}{2}$ cm = 0.73 cm.

Observations :

Average length of the cylinder l = 2.70 cm,

Average radius of the cylinder r = 0.73 cm.

Calculations : Volume of the cylinder V = $\pi r^2 l\ cm^3$ = $\frac{22}{7} \times (0.73)^2 \times 2.70$ cm^3 = 4.52 cm^3

Precautions :

1) Take the M.S.R and vernier coincide every time without parallax error.

2)Record all the reading in same system preferably in C.G.S system.

3) Do not apply excess pressure on the body held between the jaws.

4) Check for the ZERO error.When the two jaws of the vernier are in contact,if the zero division of the main scale coincides with the zero of the vernier scale no ZERO error will be there.If not ZERO error will be there, apply correction.

Result and Units : Volume of the cylinder V = 4.52 cm^3.

ii. Investigation of transpiration in potted plants under a bell jar.

Transpiration is the evaporation of water from the surface of leaves through stomata. The phenomenon of transpiration can be explained by Bell jar experiment.

REQUIREMENTS:

- Bell jar
- Well watered potted plant
- Rubber sheet
- Glass plate

PROCEDURE:

- Take the well watered potted plant and cover it with the rubber sheet. The aerial parts of the plant should be left uncovered.
- Put the plant on the glass plate and cover with the bell jar.
- Prepare a same setup but without a plant in the second bell jar.
- Place the apparatus in sunlight for sometime.

OBSERVATIONS:

Water drops appear inside the walls of the bell jar containing potted plant whereas no water drops appear in the bell jar without a plant. This demonstrates that water is evaporated from the surface of leaves in presence of sunlight.

Q.5 What safety measures will be required during?

i. Storage of flammable chemicals.

The use and storage of flammable and combustible liquids must comply with State Fire Marshal Division rules. This page is a guide to the most common regulations relating to flammable and combustible liquids.

Definitions

Combustible: A liquid with a flash point over 100°F (38°C) is considered **combustible.**

- Examples: diesel fuel, motor oil.
- Hazard: May produce ignitable vapors at elevated temperatures.

Flammable: A liquid with a flash point under 100°F is considered **flammable.**

- Examples: gasoline, acetone, toluene, diethyl ether, alcohols.
- Hazard: May produce ignitable vapors at normal ambient temperatures.

Precautions

- Ensure that all stored containers are in good condition, closed and properly labeled.
- Use flammable liquids and combustible liquids in a fume hood to prevent buildup of ignitable vapor/air mixtures or inhalation of toxic vapors or gases.
- Avoid placing ignition sources (hot materials, flames, or sparking equipment) in the general vicinity of these liquids. If possible, replace open flames by electrical heating.
- Ground equipment likely to produce a static spark.
- Implement additional safety precautions when flammable and combustible liquids are heated to or above their flash points.
- Compressed or liquefied gases present special fire hazards. Refer to the EH&S Compressed Gas Guidelines.

Contact between incompatible chemicals presents a serious fire risk. Proper handling and storage procedures should be followed.

Storage Cabinets

No more than 10 gallons (37.9L) of flammable liquids may be kept outside of an approved storage cabinet at any time. Flammable and combustible liquid storage cabinets shall meet appropriate NFPA standards and may not be modified in any way. It is not recommended to ventilate storage cabinets. If not ventilated, storage cabinet vent openings shall be sealed with the bungs supplied with the cabinet.

Safety Cans

Up to 5.3 gallons (20L) of flammable and combustible liquids may be stored in UL or FM listed safety cans. Safety cans must be constructed from metal and come equipped with a flame arrestor and spring-loaded caps on both the filling and pouring spouts to prevent spillage when dropped. The double-perforated metal surface of the flame-arrestor screen prevents flames from entering the container. Safety cans are available for both dispensing products and collecting waste. Safety cans shall not be modified. Many consumer portable fuel containers available at stores do not meet safety can standards.

Refrigerator Storage

Commercially available, domestic refrigerators contain built-in ignition sources and shall not be used to store flammable liquids or explosive chemicals. Light bulbs, switches, temperature controls, standard plugs, motor-starting relays, thermal-overload devices, and heater strips (for frost control) are all ignition sources.

Anyone who needs a refrigerator to store flammable liquids or explosives should use refrigerators specifically designed and approved for such use. Refrigerators and freezers that have either been specifically designed or modified to store flammable and/or combustible liquids safely shall be labeled as such. Labels are available from EH&S.

ii. Checking stock.

The inventory of a company is often one of its most important assets. They are available in a variety of forms such as finished and unfinished goods, work in progress, and raw materials. No matter what the actual inventory is, maintaining an accurate record is essential because it helps to calculate the holding cost of a company. The stock of a company can be managed in two ways: by stocktaking and stock checking. Although many people believe that these two are the same, there are several differences that set them apart from each other. While stocktaking is the physical process of verifying the quantity and quality of the inventory on hand, stock checking is the process that ensures that the stock levels are sufficient to meet the demands of the customers without a delay in the delivery. The basic difference between stock checking and stocktaking lies in their objectives. Although both are done to calculate the stock, the main objective is different. Stocktaking is done to check the condition of the inventory. It is a way to make sure that the inventory of the company is in good condition so that they can be used to meet the demands of the customers. There are times when the weather conditions are rough and cause adverse effects on the inventory of the company. Stocktaking is done so that the company can be sure that they don't need any fresh inventory to meet customer demands or determine whether to stock up to replace damaged goods. Stock checking, on the other hand, is the systematic process of checking the quantity of the inventory. This helps in the decision making of the company as the experts are able to understand if the stock that they currently have on hand will be able to meet the required production and the resultant output will meet the demand and satisfaction of the customers. There is also a difference in the frequency of stocktaking and stock checking. Both are equally important but the frequency of stocktaking is more dependent on the policies of the company. This can be conducted either daily, weekly or monthly basis or even on an annual basis. The volume of products that are manufactured and sold also plays an important role in the decision for stocktaking. Smaller companies prefer stocktaking on a daily or weekly basis while bigger companies prefer to get the same thing done either quarterly or annually. However, stock checking should be done almost on a continuous basis. Despite the fact you will have an idea of the amount of stock you have on hand depending on the sales volume, it is always a good idea to get the stock checked every now and then. Customer demands can increase at any time and your company should be prepared for it. If there is a need to increase the production, then the inventory has to be increased immediately. This immediate rush can be identified if the stock is checked on a continuous basis. Stocktaking can be conducted in three different ways depending on the system in which the company prefers to use. The most popular methods of stocktaking are line checks, frequency-based stocktaking, and end of lease valuation. Stock checking is also done in a systematic way and the experts can ensure that an effective procedure is followed during the calculation. They also have to perform inventory budgeting, establish a policy to calculate annual stock and maintain and monitor a perpetual inventory system.