Assignment No. 02

Q.1 Write a detailed note on the major considerations of problem identification.

Educators can use problem identification to seek solutions to resolve problems in the school environment that occur at the district, school, class, and individual level. Problem identification is part of the scientific method, as it serves as the first step in a systematic process to identify, evaluate a problem and explore potential solutions. Problem identification can be used in schools as the first in the following steps:

- Identify the problem.

- Hypothesize what is causing or maintaining the conditions around the problem.

- Select methods for assessment.

- Collect data.

- Review and analyze the data.

- Use the data to form a hypothesized solution for an intervention, or revise your initial hypotheses.

The problem-solving terminology used by the FastBridge Learning® system includes:

- Problem identification

- Problem definition

- Plan development

- Plan implementation

- Plan evaluation

This blog will dive in to the first step of problem-solving: problem identification. According to Christ & Arañas (2014), a problem can be defined as an unacceptable discrepancy between expected and observed performance. Therefore, problem analysis aims to confine this discrepancy. As mentioned previously by Dr. Rachel Brown in her blog: review of problem-solving, problem identification begins when the possibility of a problem is brought forward by a school staff member or a parent. At this stage, there are few details about the extent of the problem, or why it is present. Problem identification initiates investigation about a possible problem.

Problem identification calls upon educators to utilize a multi-source (e.g., instruction, curriculum, environment, and learner), multi-method (e.g., review, interview, observe, and test) approach in gathering information in order to ensure that the problem is matched with evidence-based, standardized interventions or solutions. As the first step in problem analysis, problem identification, if done well, provides the foundation for a solution. Bergan (1995) described problem identification as the most critical step in matching a student's need to an effective intervention. Early and effective problem identification can enable improved identification of educational needs at the district, school, classroom, or individual level, improved resource allocation, and can allow for improved intervention selection.

Problem identification consists of two steps: identifying and acknowledging that a discrepancy exists (i.e., identifying that there is a problem), and developing a problem identification statement. The following is an

example of a problem identification statement: Emily attends instruction (i.e., eyes on the instructor and/or task at hand) an average of 45% of the time, while 4th grade peers in the same classroom attend to instruction an average of 85% of the time. Effective problem identification is clear, objective, and specific. Howell, Hosp, & Kurns (2008) outline a test to determine when a problem identification statement is effective: the stranger test. According to the stranger test, problem identification statements need to be clear (i.e., unambiguous), objective (i.e., leaving no room or limited room for inferences) and specific enough for a stranger (i.e., an individual that is only provided with the problem identification statement) to be able to observe the student of interest and identify when the problem is present or absent.

Effective problem identification is well-informed. As mentioned previously, a problem is a discrepancy between expected and observed performance. This problem may arise in regards to expected behaviors, expected academic performance, or expected skill set. Therefore, to identify a problem, it is important to have an understanding of typical or expected levels of performance for a specific learner. This expected level of performance serves as a criterion by which a skill, knowledge base, or behavior can be compared. In some instances, this may come in the form of benchmark norms, expert opinion, or the Common Core State Standards in English Language Arts or Mathematics.

Effective problem identification can occur at the system, group, or individual level. Within a Multi-Tiered System of Support (MTSS), problem identification can occur at the individual, group, or system level. Part of effective problem identification is determining at which of these levels the problem exists. For example, if the problem is common for more than 20% of learners in a classroom, problem analysis should occur at the system level so that solutions are developed for all of these students. If the problem is common for 5% of learners or an identified group, problem analysis is best conducted at the group level. If the problem is rare or specific to a particular learner, problem analysis occurs at the individual level.

Effective problem identification uses an appropriate assessment tool. Problem identification requires the use of an appropriate measure or assessment tool to determine whether a problem (i.e., discrepancy) exists. For example, to determine whether a reading problem exists, an oral reading measure may be used to calculate a student's reading rate and accuracy.

Effective problem identification is timely. Finally, although problems may arise at any time throughout the school year, one primary goal of screening is problem identification. Early and regularly-scheduled screening periods allow for early intervention. When problems are identified early there is more time to address and remediate the problem.

As mentioned previously by Dr. Rachel Brown in her review of problem-solving, problem solving is a cornerstone of the FastBridge Learning® system and the FAST assessments. All FastBridge Learning® tools are aligned with a problem-solving approach. Various FAST reports can be used for problem identification, including the Class List, Impact, Group Screening, Group Growth, Detailed Group, Screening to Intervention,

Behavior, and Impact reports. In addition, FAST™ universal screening data, norm, and benchmark scores can assist educators in identifying problems in behavior, reading, and math. These data can also determine whether a particular problem is an individual, class, or school-wide problem. q

Q.2 Differentiate between limitations and delimitations by giving example.

These concepts are easy to get confused because both limitations and delimitations restrict (or limit) the questions you'll be able to answer with your study, most notably in terms of generalizability.

However, the biggest difference between limitations and delimitations is the degree of control you have over them—that is, how much they are based in conscious, intentional choices you made in designing your study.

Limitations occur in all types of research and are, for the most part, outside the researcher's control (given practical constraints, such as time, funding, and access to populations of interest). They are threats to the study's internal or external validity.

Limitations may include things such as participant drop-out, a sample that isn't entirely representative of the desired population, violations to the assumptions of parametric analysis (e.g., normality, homogeneity of variance), the limits of self-report, or the absence of reliability and validity data for some of your survey measures.

Some limitations are inherent to your research design itself. For example, you won't be able to infer causality from a correlational study or generalize to an entire population from a case study. Likewise, while an experimental study allows you to draw causal conclusions, it may require a level of experimental control that looks very different from the real world (thus lowering external validity). Of course, your choice of research design is within your control; however, the limitations of the design refer to those aspects that may restrict your ability to answer the questions you might like to answer. Limitations can get in the way of your being able to answer certain questions or draw certain types of inferences from your findings. Therefore, it's important to acknowledge them upfront and make note of how they restrict the conclusions you'll be able to draw from your study. Frequently, limitations can get in the way of our ability to generalize our findings to the larger populations or to draw causal conclusions, so be sure to consider these issues when you're thinking about the potential limitations of your study.

Delimitations are also factors that can restrict the questions you can answer or the inferences you can draw from your findings. However, they are based on intentional choices you make a priori (i.e., as you're designing the study) about where you're going to draw the boundaries of your project. In other words, they define the project's scope.

Like limitations, delimitations are a part of every research project, and this is not a bad thing. In fact, it's very important! You can't study everything at once. If you try to do so, your project is bound to get huge and unwieldy, and it will become a lot more difficult to interpret your results or come to meaningful conclusions

with so many moving parts. You have to draw the line somewhere, and the delimitations are where you choose to draw these lines.

One of the clearest examples of a delimitation that applies to almost every research project is participant exclusion criteria. In conducting either a quantitative or a qualitative study, you will have to define your population of interest. Defining this population of interest means that you will need to articulate the boundaries of that population (i.e., who is not included). Those boundaries are delimitations.

For example, if you're interested in understanding the experiences of elementary school teachers who have been implementing a new curriculum into their classrooms, you probably won't be interviewing or sending a survey to any of the following people: non-teachers, high-school teachers, college professors, principals, parents of elementary school children, or the children themselves. Furthermore, you probably won't be talking to elementary school teachers who have not yet had the experience of implementing the curriculum in question. You would probably only choose to gather data from elementary school teachers who have had this experience because that is who you're interested in for the purposes of your study. Perhaps you'll narrow your focus even more to elementary school teachers in a particular school district who have been teaching for a particular length of time. The possibilities can go on. These are choices you will need to make, both for practical reasons (i.e., the population you have access to) and for the questions you are trying to answer.

Of course, for this particular example, this does not mean that it wouldn't be interesting to also know what principals think about the new curriculum. Or parents. Or elementary school children. It just means that, for the purposes of your project and your research questions, you're interested in the experience of the teachers, so you're excluding anyone who does not meet those criteria. Having delimitations to your population of interest also means that you won't be able to answer any questions about the experiences of those other populations; this is ok because those populations are outside of the scope of your project. As interesting as their experiences might be, you can save these questions for another study. That is the part of the beauty of research: there will always be more studies to do, more questions to ask. You don't have to (and can't) do it all in one project.

Continuing with the previous example, for instance, let's suppose that the problem you are most interested in addressing is the fact that we know relatively little about elementary school teachers' experiences of implementing a new curriculum. Perhaps you believe that knowing more about teachers' experiences could inform their training or help administrators know more about how to support their teachers. If the identified problem is our lack of knowledge about teachers' experiences, and your research questions focus on better understanding these experiences, that means that you are choosing not to focus on other problems or questions, even those that may seem closely related. For instance, you are not asking how effective the new curriculum is in improving student test scores or graduation rates. You might think that would be a very interesting question, but it will have to wait for another study. In narrowing the focus of your research questions, you limit your ability to answer other questions, and again, that's ok. These other questions may be interesting and important,

but, again, they are beyond the scope of your project. With limitations an experimenter considers time constraints, nature of the experiment, instruments utilized and the sample itself. Delimitations set the boundaries of what the experimenter will not be studying and the procedures not being utilized, including reasons for both. Baltimore Public County Schools notes that certain limitations can distort qualitative research if the experimenter wishes to make inferences about a population.

According to Central Washington University, limitations and delimitations cannot be blocked, but only minimized, suggesting that researchers maintain honesty when conducting experiments. Examples of limitations include needing to use a translator because the experimental subjects speak a foreign language or relying on written response data rather than meeting the subjects.

In addition, Northern Arizona University relate limitations and delimitations to internal and external validity. Internal validity refers to the credibility and believability of the research data in the context of instrumentation construction. When researchers attempt to reduce the effect of a given limitation, it is called mitigating a threat to internal validity. External validity, or generalizability, relates delimitations to issues regarding whom, when and where. Northern Arizona University continues by adding that for an experiment to have a high internal validity, it must make a trade-off and give up some external validity.

Q.3 Explain the main sources of data in educational research.

The sources of data can be classified into two types: statistical and non-statistical. Statistical sources refer to data that is gathered for some official purposes, incorporate censuses, and officially administered surveys. Non-statistical sources refer to the collection of data for other administrative purposes or for the private sector.

The following are the two sources of data:

1. **Internal sources**
- When data is collected from reports and records of the organisation itself, they are known as the internal sources.
- For example, a company publishes its annual report' on profit and loss, total sales, loans, wages, etc.

2. **External sources**
- When data is collected from sources outside the organisation, they are known as the external sources. For example, if a tour and travel company obtains information on Karnataka tourism from Karnataka Transport Corporation, it would be known as an external source of data.

Types of Data

A) Primary data

- Primary data means first-hand information collected by an investigator.
- It is collected for the first time.
- It is original and more reliable.

- For example, the population census conducted by the government of India after every ten years is primary data.

B) Secondary data

- Secondary data refers to second-hand information.
- It is not originally collected and rather obtained from already published or unpublished sources.
- For example, the address of a person taken from the telephone directory or the phone number of a company taken from Just Dial are secondary data.

Students can also refer to Meaning and Sources of Secondary Data

Methods of Collecting Primary Data

- Direct personal investigation
- Indirect oral investigation
- Information through correspondents
- Telephonic interview
- Mailed questionnaire
- The questionnaire filled by enumerators

1. Give the meaning of the following terms: **(A) Investigator** **(B) Enumerator** **(C) Informant/Respondent**	
Answer:	
Investigator	● One who conducts investigation, i.e., statistical enquiry and seeks information is known as an investigator. ● It can be an individual person or an organisation.
Enumerator	● An enumerator is a person who helps investigators in the collection of data.
Informant	● An informant is the respondent who supplies the information to the investigators or enumerators.
(A) Direct personal investigation	● Under this method, the investigator obtains the first-hand information from the respondents themselves. ● He personally visits the respondents to collect the information (data).

(B) Following are the merits of direct personal investigation:	
(1) Reliable and Accurate	● The data collected is first-hand and original in nature. So, it is more reliable and accurate.
(2) Flexibility	● In this method, the questions can be modified according to the level of the respondent or other situations.
(3) Additional information	● Some additional information may also be collected along with the required information. ● This additional information can be used in future investigations.

Q.4 Write a detailed note on rating scale.

A rating scale is one of the most commonly used questionnaire types for online as well as offline surveys. It consists of close-ended questions along with a set of categories as options for respondents. A rating scale helps gain information on the qualitative and quantitative attributes.

The most common example of rating scales is the Likert scale and 1-10 rating scale. For instance, when you visit an online shopping site and it asks you to rate your shopping experience. Such type of question and choice of option is called rating scale.

The rating scale is a popular choice for conducting market research. It can serve the purpose of gathering more relative information about a product or certain aspects of the product. The scale is commonly used to gain feedback or to evaluate. A rating scale can be used to gain insight on the performance of a product, employee satisfaction or skill, customer service performance, etc.

A rating scale is divided into two categories: Ordinal scale and Interval scale. Some data are measured at ordinal level and some at interval level.

Ordinal Scale: An ordinal Scale gathers data by putting them in a rank but without a degree of difference.

Interval Scale: An interval scale measures data with equal distance between two adjacent attributes.

Types of Rating Scale

Rating scales can fall under the following types of scales.

Numeric rating scale or NRS:

- Numeric rating scale uses numbers to identify the items in a scale. However, not all the numbers need to have an attribute attached to it.
- For example, you can ask your target audience to rate your product from 1 to 5 on the rating scale. You can put 1 as totally dissatisfied and 5 as totally satisfied.

Verbal rating scale or VRS:

- Verbal rating scales are used for pain assessment. Also known as verbal pain scores and verbal descriptor scale compiles a number of statements that describe the intensity of pain and duration.

- For instance, when you go to a dentist and you are asked to rate the intensity of your tooth pain. At that time, you receive a scale with items like, "none", "mild", "moderate", "severe", and "very severe".

Visual analog scale or VAS:

- The idea behind VAS is to let the audience select any value from the scale, in between two endpoints. In the scale, only the endpoints have attributes allotted to numbers and the rest of the scale is empty. Often just called a slider scale this allows the audience to rate whatever they want without being restricted to particular characteristics or rank.

- For example, a scale rating from extremely easy to extremely difficult, with no other value allotted in the scale.

Likert scale:

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- A Likert scale is useful tool for effective market research to receive feedback on a wide range of psychometric attributes. The agree-disagree scale is particularly useful when your intention is to gather information on frequency, experience, quality, likelihood, etc.

- For example, to evaluate employee satisfaction with company policies, a Likert scale is a good tool to use.

Graphic rating scale:

- Instead of numbers imagine using pictures, such as stars or smiley faces to ask your customers and audience to rate. The stars and smiley faces can generate the same value as a number.

Descriptive rating scale:

- In certain surveys or research numeric scale may not be of much help. A descriptive rating scale, explains each option for the respondent. It contains a thorough explanation for the purpose of gathering information with deep insights.

Advantages of Rating Scale

- A rating scale is a simple and easy tool for both the researcher and the audience,
- In terms of marketing surveys, a rating scale is a valuable tool for data analysis. It can gain product review for evaluation and a further improvement in marketing strategy.

Disadvantages of Rating scale

- It does not help collect the reason behind a customer review. A rating scale gets access to the overall experience but not the reason behind the perception of the audience.
- In the case of VRS, the rating scale may oftentimes overestimate the patient's pain experience. In addition to that, patients with limited vocabulary may not understand the statements in a verbal descriptor scale.

Q.5 Discuss the guidelines and rules for writing a report.

In technical terms, the definition of a report is pretty vague: any account, spoken or written, of the matters concerning a particular topic. This could refer to anything from a courtroom testimony to a grade schooler's book report.

Really, when people talk about "reports," they're usually referring to official documents outlining the facts of a topic, typically written by an expert on the subject or someone assigned to investigate it. There are different types of reports, explained in the next section, but they mostly fit this description.

What kind of information is shared in reports? Although all facts are welcome, reports, in particular, tend to feature these types of content:

- Details of an event or situation
- The consequences or ongoing effect of an event or situation
- Evaluation of statistical data or analytics
- Interpretations from the information in the report
- Predictions or recommendations based on the information in the report
- How the information relates to other events or reports

Reports are closely related to essay writing, although there are some clear distinctions. While both rely on facts, essays add the personal opinions and arguments of the authors. Reports typically stick only to the facts, although they may include some of the author's interpretation of these facts, most likely in the conclusion.

Moreover, reports are heavily organized, commonly with tables of contents and copious headings and subheadings. This makes it easier for readers to scan reports for the information they're looking for. Essays, on the other hand, are meant to be read start to finish, not browsed for specific insights.

Types of reports

There are a few different types of reports, depending on the purpose and to whom you present your report. Here's a quick list of the common types of reports:

Academic report: Tests a student's comprehension of the subject matter, such as book reports, reports on historical events, and biographies

Business reports: Identifies information useful in business strategy, such as marketing reports, internal memos, SWOT analysis, and feasibility reports

Scientific reports: Shares research findings, such as research papers and case studies, typically in science journals

Reports can be further divided into categories based on how they are written. For example, a report could be formal or informal, short or long, and internal or external. In business, a **vertical report** shares information with people on different levels of the hierarchy (i.e., people who work above you and below you), while a **lateral report** is for people on the author's same level, but in different departments.

There are as many types of reports as there are writing styles, but in this guide, we focus on academic reports, which tend to be formal and informational.

The structure of a report depends on the type of report and the requirements of the assignment. While reports can use their own unique structure, most follow this basic template:

Executive summary: Just like an abstract in an academic paper, an executive summary is a standalone section that summarizes the findings in your report so readers know what to expect. These are mostly for official reports and less so for school reports.

Introduction: Setting up the body of the report, your introduction explains the overall topic that you're about to discuss, with your thesis statement and any need-to-know background information before you get into your own findings.

Body: The body of the report explains all your major discoveries, broken up into headings and subheadings. The body makes up the majority of the entire report; whereas the introduction and conclusion are just a few paragraphs each, the body can go on for pages.

Conclusion: The conclusion is where you bring together all the information in your report and come to a definitive interpretation or judgment. This is usually where the author inputs their own personal opinions or inferences.

There are no firm requirements for what's included in a report. Every school, company, laboratory, task manager, and teacher can make their own format, depending on their unique needs. In general, though, be on the lookout for these particular requirements—they tend to crop up a lot:

- **Title page:** Official reports often use a title page to keep things organized; if a person has to read multiple reports, title pages make them easier to keep track of.
- **Table of contents:** Just like in books, the table of contents helps readers go directly to the section they're interested in, allowing for faster browsing.
- **Page numbering:** A common courtesy if you're writing a longer report, page numbering makes sure the pages are in order in the case of mix-ups or misprints.

- **Headings and subheadings:** Reports are typically broken up into sections, divided by headings and subheadings, to facilitate browsing and scanning.

- **Citations:** If you're citing information from another source, the citations guidelines tell you the recommended format.

- **Works cited page:** A bibliography at the end of the report lists credits and the legal information for the other sources you got information from.

As always, refer to the assignment for the specific guidelines on each of these. The people who read the report should tell you which style guides or formatting they require.

Reports should be as long as they need to be -- no longer. Brevity is desirable, provided the necessary information is properly communicated. Some suggestions: Avoid reproducing standard information, for example, calibration curves. Avoid appendices unless there is a specific reason for them. Consider each sentence - does it meaningfully contribute to the report?

The reports should consider the background of the fictitious person described in the project scenario. The quality of the report can suffer both from overly detailed as well as too incomplete descriptions

Only the title page, the abstract, the introduction, and the references should start on a separate page; the other sections should not. However, a heading needs to indicate the beginning of each section. Sub-headings within sections can be an excellent way to further organize the report

While scientific writing does not have to be elegant, it must be precise. To state "The data were plotted and seemed to agree with the theory." is not precise. To state that "The pressure drop across the column in inches of water was plotted on log-log coordinates as a function of air flow rate in cubic feet per minute. The plot, shown in Figure 3, was close to linear and the slope of the best straight line, 1.92, was close to 2, as predicted by theory." is precise. Also, whenever possible, phrases such as "small", "large", "greater than", should be used in conjuction with the actual numbers.

A table or figure should never be inserted into the report without first referring to that table or figure in the text. Reference to a figure should include a brief description of what it contains and what it contributes to the point under consideration. Figures and tables should be merged into the text or placed on a separate page immediately following the first page on which they are mentioned; they should not be collected at the end of the report.

References must be numbered in the order that they are cited. It is good practice to attribute and acknowledge. The first of these protects against charges of plagiarism. The second gains friends and shows a generous nature.

- A suitable font is Times Roman, 12 pt.

- A uniform verb tense should be used throughout the report, preferably past tense.

- The imperative mood, i.e. as if giving directions or orders, should not be used. The purpose is to state what was done, not to tell other people what to do.

- Since the reports are formal, the first person (singular "I" or plural "We") should not be used.

- Sentences should not start with "It" unless the object that "It" refers to is absolutely clear from the context

- All text should be double-spaced to allow room for comments.

- All pages, including figure pages, should be numbered consecutively.

- Overly long sentences should be avoided. Two or more short sentences should be used instead. An excellent way to improve style and grammar is to have others proofread the report.