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THE PREVALENCE OF KEY NEEDS ASSESSMENT TASKS AS PERCEIVED BY HUMAN PERFORMANCE IMPROVEMENT PRACTITIONERS

by

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DISSERTATION

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Approved By:

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Advisor   Date

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DEDICATION

This dissertation is dedicated to my beloved family and loyal friends whose help, support, and generosity have encouraged me to achieve my goal.

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CHAPTER 1 INTRODUCTION

1. Background

The field of Human Performance Improvement (HPI) has gained considerable attention over the past five decades. Since the early 60s of the past century when Gilbert transferred and applied principles of behaviorism to work places, the field has learned a lot about itself and noticeably evolved in both theoretical and practical aspects. Gilbert is considered by many scholars in the field as the father of the HPI because of his unique contributions; however, many other influential pioneers have contributed to the evolution of the field (Stolovitch & Beresford, 2012). This evolution has "led to a vast body of literature: theoretical concepts and models, case studies, and lessons learned from application" (Pershing, 2006). Consequently, several aspects and areas of emphasis associated with the HPI field have been developed and discussed throughout its literature. One of the well-known aspects of HPI was needs assessment (NA). As a term, NA is discussed under different titles; for example, to many scholars in the field it is called performance analysis (Van Tiem, Moseley & Dessinger, 2012), others called it simply NA (Kaufman & Guerra-López, 2013), and Harless has called it front-end analysis (Richey, Klein, & Tracey, 2011). However, Sleezer (1992) pointed out the variety of conceptualizations of these related terms (needs assessment, needs analyses, front-end analysis, and performance analysis) and how they could be different from one another. In addition, not only was the name or the title varied but also the definition of the term was addressed from different perspectives. For example, Kaufman and Guerra-López (2013) pointed out that NA is the identification of "gaps between current and desired results—not means—and places those in priority order on the basis of the cost to meet the needs as compared to the costs to ignore the needs." Another definition was provided by Altschuld (2004); he defined NA as "the process of identifying needs, prioritizing them, using the

information so obtained to make needs-based decisions, allocating resources and implementing actions within organizations to resolve problems underlying high-priority needs."

Regardless of the debates about the definition and the best name, NA was regarded as the best-suited approach for improving performance (Watkins, Leigh, Platt, and Kaufman, 1998). Therefore, NA was and is still used by human performance practitioners as an essential tool for improving individual and/or organizational performance, in which it occurs as the first step in the HPI process (Van Tiem et al. 2012). In fact, practitioners are using NA in their professions and finding its great benefits. Watkins, West-Meiers, Visser & Ebrary (2012) have discussed some of these benefits mentioning that NA guides the decision-making process no matter how big or small the decision is because it follows a systematic process, so it is conducted as a step-by-step approach. NA is also considered as a very useful performance improvement tool because it helps practitioners justify their decisions before making them; in this sense, it is a proactive approach. As a systemic approach, NA also helps practitioners consider what affects and/or is being affected by the decision or an intervention needed to be implemented for closing performance gaps as recommended by NA results. In addition, NA provides ways for finding interdisciplinary solutions for complex workplace problems.

The use of NA in the field of HPI has grown and evolved as the whole field has. McCullough (2011) proposed a brief history of NA, and Watkins et al. (1998) discussed different aspects associated with NA: they have clarified the well-related terms, and documented the major contributions to the NA literature, specifically books and journal articles. However, it is almost impossible to write a separate history of need assessment apart from other components of the HPI field (e.g., gap analysis, cause analysis, intervention selection, design, development, implementation, and evaluation). The field is a holistic umbrella, so all of its components have

grown and evolved together affecting one another. However, a certain aspect of NA (development of its definition, major pioneers/contributors, NA models, etc.) can be documented and traced back to its origins with the help of the literature. For example, Leigh, Watkins, Platt & Kaufman (2000) have focused on one aspect of NA; by discussing and comparing several NA models. Tosti & Kaufman (2007) have spotlighted the most influential scholars in the field of HPI many of whom have significantly influenced the science and practice of the HPI field in general and NA as an essential part of the field.

In addition, if Thomas Gilbert is considered the father of HPI field (Richey et al. 2011), Roger Kaufman was considered the father of NA (Barton, 2011). Many theoretical and practical aspects associated with NA have been extensively and thoroughly documented and discussed in the massive works of Kaufman and other prominent contributors to this field, for example, but not limited to, the works of James Altschuld, Ryan Watkins, and Allison Rossett.

Generally, the previous studies in NA were divided in to three major categories: (a) studies that discuss NA as a whole from a theoretical aspect, e.g., Altschuld & Witkin, 2000; Burton & Merrill, 1991; Kaufman & Guerra-López, 2013; Watkins et al., 2012; Witkin & Altschuld,1995, (b) studies that discuss a specific aspect(s) associated with NA, e.g., Watkins et al.,1998; Moseley & Heaney, 1994; Sleezer, 1992; Leigh et al., 2000; Trimby, 1979; Dewit & Rush, 1996), and (c) studies that empirically address NA. These studies have used different models and different methodologies in the purpose of using NA as a decision-making vehicle e.g., Scurlock, Dexter, Reich, & Galati, 2011; Swart & Kaufman, 2009; Axford, 2010; Bates & Holton, 2002; Boiarsky, 2004; O'Sullivana, M., 2003; Masinton, Smith & Solomon, 1981; McBride, Beer, Mitzner & Rogers, 2011; Esan & Fatusi, 2014; Palmer, 2006; Lundberg, Elderman, Ferrell & Harper, 2010; Doyle & Henry, 2014.

2. Research problem statement, purpose, justification, and questions

The review of NA's literature clearly shows that HPI practitioners were applying NAs as the starting point for "making knowledgeable and justifiable decisions" (Watkins et al. 2012). In fact, ending up with making a sound decision is actually what matters in conducting NA. Ubulom and Uranta (2013) emphasized that "the essence of using NA for decision-making is not to allow a problem to surface but to use NA to monitor a program and to make decisions which will lead to the avoidance of a problem." The literature also emphasizes the conduct of NA following specific processes or tasks. Therefore, several models of NA have been introduced as guidelines for conducting procedural and decision-based NA, for example, Kaufman's Organizational Elements Model, Mager and Pipe's Performance Analysis Model, Robinson and Robinson's Performance Relationship Map, Rossett's Training NA Model, and Rummler and Brache's Relationship Map (Leigh et al. 2000). In the literature, the discussion about NA models has covered different aspects. Leigh et al. (2000) compared fourteen models of NA based on several organizational emphases; similarly, Trimby (1979) compared four NA models based on eight criteria in order to determine the similarities, differences, application conditions, and other associated concepts or ideas. Sleezer (1992) also examined the similarities and differences between several models of NA by focusing on where the models start, where they end, and what results they produce. Dewit & Rush (1996) have discussed several models of NA in terms of the model strengths and weaknesses.

However, there have been no empirical studies that focus on comparing and contrasting different NA models in terms of the tasks/steps used for conducting NA, the prevalence of using each task by HPI practitioners, and the factors that impact the use of each task. Therefore, the main purpose of the current study was to contribute in closing this gap in literature by exploring:

(a) The prevalence of key tasks of NA. The identification of a task to be a key task was based on reviewing and analyzing several NA models in order to extract the common steps or tasks that have been identified in each model. The significance of studying the prevalence of the key tasks (common tasks discussed in the literature) was to align theoretical and practical aspects. So, as these tasks were considered commonly used from the theoretical aspect, the current study was intended to explore the prevalence of these tasks from the practical aspect.

(b) The factors that impact the use/conduct of each task. Each factor was examined in terms of its provision/possession while performing each key task and its importance to each key task. The reason for studying and caring about the factors impacting performance was to help HPI practitioners in terms of developing their awareness about the factors that affect human performance so that factors carrying positive impact may be encouraged and the barriers or the factors carrying negative impact may be avoided. Moreover, we should study these factor not only to know and list the positive and negative effects on human performance but also, as Farcasiu & Prisecaru (2012) concluded, to help organizations in the identification of corrective actions in any given operation. Therefore, HPI practitioners should be aware of the factors impacting human performance because the awareness of those factors could contribute to managing and controlling the consumption of the essential resources (time, effort, money, etc.) needed for any project (Harriott & Adams, 2013). Additionally, studying the factors that impact human performance is very beneficial to the field of Instructional Design and Technology because the field is advancing from instructional design to human performance technology; so, Instructional Design and Technology professionals need to "understand all the factors influencing human performance, so that they could apply them properly to improve the performance" (Bandhana, 2010).

To fulfill the purpose of the current study, the researcher reviewed and analyzed several models of NA in order to extract the common tasks. The selection of the models was based on Leigh et al. (2000). This was a phenomenal study that addressed a verity of NA models. The authors discussed fourteen NA models: Burton & Merrill's Model, Gilbert's Model, Gordon's Model, Hannum & Hansen's Model, Kaufman's Model, Mager & Pipe's Model, Murk & wells's Model, Nelson, Whitener & Philcox's Model, Ostroff & Ford's Model, Robinson & Robinson's Model, Rossett's Model, Rothwell & Kazanas's Model, Rummler & Brache's Model, and Witkin & Altschuld's Model. Moreover, the authors of this article are well-known and very influential in the field of NA; so, recognition of these NA models by all these pioneers and scholars has convinced the researcher to trust their selection. In addition, the authors have indicated that these models have been considered the most seminal, influential, and widely used by practitioners in the field of HPI.

However, not all of the aforementioned models were discussed in the current study because some of them do not identify specific tasks or phases to be used by practitioners when conducting NA; for example, the model introduced by Murk & Wells (1988), the Systems Approach Model, has identified NA as one component of the system approach model with no specific steps of how to conduct NA; so, this model is not applicable for fulfilling the purpose of the current study. Moreover, this study only discusses the models which address NA in one or more levels of results (Mega, Macro, Micro). Accordingly, some models were excluded because they were devoted to addressing training NA, e.g., the model introduced by Gordon's (1994), Front-End Analysis Model, the model introduced by Ostroff & Ford (1989), Content-Levels Framework and its modified version introduced by Nelson, Whitener & Philcox (1995), and the model introduced by Rossett (1987), Purpose-Bases Assessment. Furthermore, the model was not selected if it was

recognized by other scholars to be used for causal analysis, e.g., the model introduced by Gilbert (1978), Behavioral Engineering Model (Kaufman & Guerra-López, 2013; Van Tiem et al. 2012; Richey et al. 2011), and the model introduced by Mager & Pipe (1983), Performance Analysis Flow Diagram (Kaufman & Guerra-López, 2013). Therefore, and based on these two criteria (a model must define specific steps for conducting NA and address it in one or more levels of results), seven models were selected for examnation in the current study; these are the models of Burton & Merrill, Hannum & Hansen, Kaufman, Robinson & Robinson, Rothwell & Kazanas, Rummler & Brache, and Witkin & Altschuld.

In fact, NA is a human practice by nature heavily affected by the factors that affect human performance. Therefore, those factors were addressed as another important aspect of this study. Since human performance is diverse based on many variables, the factors influencing performance are varied as well. Many studies have proposed different perspectives on how the factors impacting human performance could be grouped and classified, e.g., Robinson & Robinson (1995), Locke, Frederick, Lee & Bobko (1984), Genaidy & Karwowski (2003), Genaidy, Rinder, Sequeira & A-Rehim (2009), Genaidy, Karwowski & Shoaf (2002), Kosmowski (1995), Harriott & Adams (2013). In fact, looking closely at the proposed grouping and classification of the factors impacting human performance, one can infer that those factors can be divided into two major categories: the first category could be identified as environmental/organizational factors, and the second category was human/individual factors. One of the well-known models in the HPI field that addresses these two major categories was the Behavioral Engineering Model (BEM) first proposed by Thomas Gilbert in 1978. As the current study focuses on the use of each key task of NA as identified above, the BEM model will be used as a framework for determining the factors that impact the use of each task. Consequently, the research instrument was designed and described to the target audience

based on the six factors of the BEM. In addition, these factors that impact performance were studied in relation to each task separately in order to determine the provision/possession of each factor while performing each key task and the importance of each factor to each key task.

The two main questions which guide the current study are:

1- What is the frequency of using each key needs assessment task by Human Performance Improvement practitioners?

2- What are the factors that impact the use of each key needs assessment task as they are perceived by Human Performance Improvement practitioners?

3. Definition of terms

Needs assessment tasks: In the current study, the term 'task' is used to represent a single operation that should be conducted as an essential part of NA as a whole process. Recognizing that, there was variation among NA models in terms used for explaining/presenting how NA should be conducted. The researcher noticed that the NA models used different terms for presenting how NA should be conducted. For example, some authors used the term 'tasks'; used 'phases'; some preferred to use 'steps'; and some others used 'components'.

Key tasks of needs assessment: In the current study, categorizing a task as 'key' means it is an essential aspect of NA, recognizing that it likely involves several detailed sub-tasks identified based on the situation where the NA is being conducted.

Common tasks of NA: In the current study, the task is considered a common task if it has been addressed in three or more models.

NA models: In the current study, only seven NA models were addressed: Burton & Merrill, Hannum & Hansen, Kaufman, Robinson & Robinson, Rothwell & Kazanas, Rummler & Brache,

and Witkin & Altschuld. The selection of these models was based on their recognition by Leigh et al. (2000).

Human Performance Improvement Practitioners: The current study targets only HPI practitioners who are familiar with conducting NA.

Factors impacting human performance: The word 'factor' in the current study is used to represent the influential ideas or objects that impact human performance. This should be noted so as not to be confused this with other commonly used factors such as statistical ones. In addition, the Behavioral Engineering Model (BEM) by Gilbert (1978) was used as a framework for determining the factors impacting human performance. Six factors in two main categories were addressed: (A) The Environmental supports factors: A1. Data: Information, A2. Instrument: Resources, and A3. Incentives: Rewards. (B) Individual repertory factors: B1. Knowledge: Knowing how to perform, B2. Capacity: Physical and intellectual ability, and B3. Motives: Willingness to work.

Summary

This chapter has provided an introduction to the current study's focus. It addressees the research problem statement, purpose of the study, and the study's main two questions. The justification and significance of the current study were discussed. The following chapter, Chapter Two, will be the literature review.

CHAPTER 2 LITERATURE REVIEW

1. Introduction

Needs assessment (NA) has been placed by many authors as a vital step that comes at the beginning of the HPI work. Therefore, instructional designers and/or performance improvement practitioners have been urged to conduct NA as an essential tool for addressing performance gaps, determining causes, and providing sufficient and effective interventions or solutions. This gave NA top priority to be used in any effort devoted to improving human performance (Murk & Wells, 1988); (Nelson et al. (1995) and (Rothwell & Kazanas, 2004). Indeed, the literature of NA has shown an abundance of empirical publications and research that apply NA in different settings and workplaces, e.g., Scurlock, Dexter, Reich, & Galati, 2011; Swart & Kaufman, 2009; Axford, 2010; Bates & Holton, 2002; Boiarsky, 2004; O'Sullivana, M., 2003; Masinton, Smith & Solomon, 1981; McBride, Beer, Mitzner & Rogers, 2011; Esan & Fatusi, 2014; Palmer, 2006; Lundberg, Elderman, Ferrell & Harper, 2010; Doyle & Henry, 2014. These studies have used different models and different methodology in addressing the intended topics. In fact, these studies have almost one common intention which is using NA as a decision-making vehicle. Other studies have addressed NA from a theoretical perspective; for example, Watkins et al. (1998) reviewed and compared many publications associated with NA literature, Moseley & Heaney (1994) explored NA across selected disciplines with intention of identifying and determining common applications of NA, and Sleezer (1992) examined different perspectives about NA as they were discussed in the literature of Performance Technology and Human Resources. Very few studies have devoted their focus on NA models; for example, Leigh et al. (2000) compared fourteen models of NA based on several organizational emphases; similarly, Trimby (1979) compared four NA models based on eight criteria in order to determine the similarities, differences, application conditions, and other

associated concepts or ideas. Also Sleezer (1992) examined the similarities and differences between several models of NA by focusing on where the models started, where they ended, and what results they produced; Dewit & Rush (1996) discussed several models of NA in terms of the models' strengths and weaknesses.

The researcher has conducted extensive literature review through multiple data bases that are available through WSU library system including but not limited to Google Scholar, ERIC and ProQuest. The purpose is to look for empirical studies that are devoted to studying NA models in terms comparing and contrasting NA tasks, and the factors that impact the use of each one. Different key words is used for this purpose such as needs assessment, needs assessment models, needs assessment tasks, comparing and contrasting NA models, factors impacting human performance, and similar words. According to that review, the researcher has concluded that there have been no empirical studies that focused on comparing and contrasting different NA models in terms of the tasks/steps used for conducting NA, the prevalence of using each task by HPI practitioners, and the factors that impact the use of each task. Therefore, the main purpose of the current study was to contribute in closing this gap to literature by exploring: (a) the prevalence of key tasks of NA, whereby the identification of a task to be a key task was based on reviewing and analyzing several NA models in order to extract the common steps or tasks that have been identified in each model, and (b) the factors that impact the use/conduct of each task by examining each factor in terms of two variables: the provision/possession while performing each key task and the importance of each factor to each key task.

This chapter contains four sections. The first section is an introduction. The second section introduces seven models of NA focusing on two points: an overview and a description of each model. The third section is analysis and the synthesis of NA tasks based on the selected models.

This section was developed in the following four steps: (1) analyzing the models by aligning each model and its key tasks/steps; (2) stating the criteria the researcher followed as a base for recognizing a task as a common task; (3) aligning each common task and the models where it has been indicated; and (4) synthesizing the common tasks ending up with introducing the key NA tasks to be studied in order to fulfill the purpose of the current study. The fourth section addresses human performance and the impacting factors; the discussion begins with identifying what human performance this study was associated with, and then pointing out different points of view as to how the factors that impact human performance have been categorized, and finally what factors the current study has addressed, and how these factors have been determined.

2. Needs Assessment models

In this section of the literature review, seven NA models were addressed: Burton & Merrill, Hannum & Hansen, Kaufman, Robinson & Robinson, Rothwell & Kazanas, Rummler & Brache, and Witkin & Altschuld. The selection of these models was based on the recognition of these models by Leigh et al. (2000). In fact, the authors mentioned these seven models among the fourteen NA models they recognized as the most seminal, influential, and widely used by practitioners in the field of HPI. However, and as discussed in Chapter One, not all of the fourteen models were addressed in the current study because (a) some of those models did not identify specific tasks or phases to be used when conducting NA, and (b) others were devoted solely to training NA, or recognized by some authors in the field to be used specifically for causal analysis. Therefore, the current study has selected the aforementioned seven models based on the following two criteria: (1) a model must define specific steps for conducting NA, and (2) a model must address NA in one or more levels of result: mega, macro, and micro. Here, each one of these seven models will be discussed with an overview and a description.

a. Burton and Merrill's Model

Overview

Based on their belief that the instructional design process starts with NA, Burton and Merrill published their NA model in 1991 in order to urge instructional designers to use NA to develop solutions that meet high-priority needs (Burton & Merrill, 1991). Generally, the model they developed has four main phases: (1) identify a broad range of possible goals, (2) rank the goals in order of importance, (3) identify discrepancies between desired and actual performance, and (4) set priorities for action. These phases are applicable at any level of results (Burton & Merrill, 1991). According to Watkins et al. (1998), the model is also "applicable for practitioners in a variety of disciplines, and recognizes both internal and external clients." In fact, the authors of this model have specified their goal of publishing this models by stating that their focus was "on the application of NA in the development of instructional materials at the level of course" (Burton & Merrill, 1991). In addition, Burton & Merrill's NA model is better used for identifying instructional goals and not the performance objectives because this way would increase the reliability, specificity, and accuracy of the decision made based on NA (Watkins et al., 1998).

Description of the model

As discussed above, Burton & Merrill's NA model has four main phases. Since the authors have specified their focus on the course level, they explained the model's main four phases by determining four main steps in each phase: input, operators, operations, and output with detailed outline under each step. Table 1 illustrates this model of NA, its main tasks, and associated details.

Table 1

Burton & Merrill's Model.

Main tasks (Phases)	Explanations
Phase 1: **Inputs**	

Identify a Broad Range of Possible Goals.	1. Past course syllabi from other instructors or institutions 2. State, district, or school goal statements (if available) 3. Certification requirements (if appropriate) 4. Extant course materials (texts, handouts, etc.) 5. Entry level requirements for subsequent course(s) 6. Course level and learner characteristics 7. Needs assessments from similar courses 8. Any related literature available 9. Mager's Analysis… 10. Osborn's Applied Imagination… (optional)

Operators

1. Appropriate project staff
2. Representatives from the following groups where relevant
   a. students (potential enrollees in the course)
   b. instructors (responsible for course)
   c. administrators (if course is part of a larger program or feeds into several courses)
   d. parents (if course is to meet family or community goals)
   e. employees (if course is job related)
   f. additional instructors (if course feeds into other courses)
   g. supervisors (if course is job related)

Operations (Subtasks):

1. Select the persons listed under operators and form a small committee which includes appropriate project staff.
2. Review inputs (either individually or as a group) for background and perspective.
3. Brainstorm goals (If none of the operators are familiar with this technique, a review of Osborn's Applied Imagination may be necessary). Remember, the purpose of this phase is to generate a broad set of goals, so opt for quantity and withhold qualitative judgments.
4. Do a preliminary screening to combine related goals; break down goals that are too complex; eliminate redundancies and "solutions" disguised as goals,
5. Perform goal analysis (Define goals in measurable terms.)
6. Obtain consensus on final list of goals.

Outputs
Lists of goals

Phase 2: Rank Goals in order of Importance	**Inputs:** Lists of goals from Phase 1 **Operators:** Project staff measurement specialist. **Operations (Subtasks):** 1. Select or generate an instrument to rank the list of goals from Phase 1.

2. Identify which of the following community subgroups should be involved in rating the goals:
  a. students who have taken the course
  b. students who will take the course
  c. students now taking the course
  d. instructors (past, present, and future)
  e. instructors from other institutions
  f. program faculty (especially those who teach prerequisite and subsequent courses)
  g. non-major faculty (faculty of areas that send students to the course or might do so)
  h. administrators
  i. parents (if course has community impact)
  j. employers (if course is job related)
  k. any other relevant experts" or "wise people" not included above
4. Administer instrument to a sample of individuals drawn from each of the subgroups identified in step 2.
5. Analyze the responses and determine the mean ranking for each goal. (You might also analyze your data by subgroup.)
Outputs:
 Lists of goals in rank order

Phase 3:	**Inputs:**
	Goals listed in order of importance
Identify	**Operators:**
Discrepancies	Project staff measurement specialist and committee constituted in Phase 1
Between	**Operations (Subtasks):**
Desired and	1. Determine the type of data you will need to collect for each goal to
Actual	assess the way things "are." If you cannot determine what type of data
Performance	would be appropriate, your goals may not be defined in measurable
	terms. Remember that one or more of the following types of data may
	be used:

  a. Performance ratings based on observations
  b. Paper-and-pencil test scores
  c. Behavioral frequency counts
  d. Extant data
2. Develop or select instruments or records which will provide the required data. If you have the necessary expertise and resources, check your instruments for reliability and validity. Make sure instruments are not cumbersome to use or to ad minister. Pilot testing of new instruments may help identify unexpected problems.
3. Once the measurement instruments have been developed or identified, the committee constituted in Phase 1 should be reassembled to approve the instruments and to set the desired or expected (ought to be) performance criteria level for each goal.

4. If the course does not yet exist, collect data on students projected to enroll in the course; otherwise, collect data on students who have just completed the course. If the number of students is large, you may have to collect data on only a sample.
5. Compute the discrepancy between the expected and actual performance for each goal by subtracting the mean student performance obtained in step 4 from the criteria specified for corresponding goal in step 3. If the difference is positive then you have identified a need.
6. Prepare a list of the needs identified in step5. Each need should be stated so as to indicate:
   a. the target population
   b. the discrepant behavior
   c. the actual performance (what is)
   d. the expected performance criteria (what ought to be)

Outputs:
Lists of needs statements

Phase 4:	**Inputs:**
	Lists of needs statements in Phase 1.
Set Priorities	**Operators**:
for Action	Committee constituted in Phase 1.

Operations (Subtasks):
1. Rate each need according to some agreed upon criteria. The following are possible criteria:
a. cost of meeting the need versus cost of ignoring the need…
b. rank of corresponding goal (from Phase 2)
c. magnitude of need (from Phase 3)
d. utility of need reduction
e. length of time need has existed
f. number of students affected
g. time to remediate the need
h. feasibility of remediating the need
2. Obtain a consensus on the needs priorities.
3. Set target data for resolution of priority needs.

Outputs:
Lists of needs statements in priority order. The needs statements should include the target date for need resolution.

Note: Based on Burton, J., & Merrill, P. (1991). Needs assessment: Goals, needs and priorities. In L. J. Briggs, K. L. Gustafson, & M. H. Tillman (Eds), Instructional design: Principles and applications (2nd ed.). Englewood Cliffs, N.J: Educational Technology Publications.

b. Hannum & Hansen's Model

Overview

In 1989, Hannum and Hansen published their book, *Instructional System Development in Large Organizations*. In this book, the authors developed a model for Instructional System Design (ISD) following the systems approach. Their model has five general phases or stages with several tasks under each one. The main phases of the model are: Front-End Analysis, Design, Development, Implementation, and Evaluation (Hannum and Hansen, 1989). Since this model of ISD followed the systems approach, it was very similar to the other ISD models that followed the systems approach. Therefore, it was process-oriented and systematic and had the common five stages: Analysis, Design, Development, Implementation, and Evaluation (Slee and Mukherjee 1991). Clearly, this model was one of those models that belong to the large umbrella of so-called ADDIE models for ISD.

What is important in Hannum and Hansen's model for the current study is the first phase of this model, the Front-End Analysis. The authors have detailed steps with sub steps of each one to be used as a guideline when applying the Front-End Analysis for assessing needs. In fact, this phase can be considered as a distinguished model for NA to help practitioners assess complex performance needs. The authors stressed that "needs in large organizations are multidimensional and originated from different places, and [the authors] provide a number of examples of actual problems, their sources, tasks, and critical events. This is extremely helpful... and consistent with what occurs in the actual practice" (Slee and Mukherjee, 1991).

Description of the model

Generally, Hannum and Hansen's NA model is used to "examine only gaps in result at the level of the individual performer and they suggest that their model be used solely to document process inefficiencies" (Leigh et al 2000). In addition, this model for NA, according to Watkins et al. (1998), is "reasonably strong on research methods with guidelines for the collection of hard

(independently verifiable) and soft (not independently verifiable) data, which are applicable in a variety of settings."

As emphasized by Hannum and Hansen (1989), the authors have determined six main tasks or steps for conducting the Front-End Analysis with a number of sub tasks associated with each. Table 2 illustrates the main tasks of this model and their sub tasks.

Table 2

Hannum and Hansen's Model.

Main tasks	Subtasks
1. Respond to request for training assistance.	1. a. Meet with client to gather initial information on history and scope of problem. 1. b. Explain scope of your services and methodology. 1. c. Gather initial information about the organization's mission and environment.
2. Negotiate assessment plan.	2. a. Develop plan for sources, instruments, methodology time limits, field procedures, expected balance of quantitative and qualitative data, and criteria for decision-making. 2. b. Negotiate assessment plan and gain management commitment. 2. c. Document trade-offs and risk of invalid findings if negotiated plan differs greatly from the ideal.
3. Collect data on overall problem.	3. a. Select and/or develop data collection instruments. 3. b. Gather information 3. c. Document collected data by preparing charts, tables, etc.
4. Analyze incidence of problem.	4. a. Calculate quantitative and qualitative data. 4. b. Compare data against preferred norms to determine performance gaps.
5. Determine probable cause(s) of performance gaps.	5. a. Distinguish between needs that can be solved by training and those related needs that must be addressed by a change in organizational procedures or policies. 5. b. Document and discuss training-related be addressed by the organization.

6. Prioritize identified training needs.	6. a. Link training needs to existing or new jobs.
	6. b. Identify job components by conducting job task analysis for each specified job.
	6. c. Assess capability of current job incumbents to complete tasks.
	6. d. Prioritize criticality of tasks that require training.

Note: Based on Hannum, W., & Hansen, C. (1989). Instructional System Development in Large Organization. Englewood Cliffs, NJ: Educational Technology Publications, Inc.

c. Kaufman's Model

Overview

Roger Kaufman was a well-known figure in the field of HPI because of his influential contributions to the field, especially in strategic planning and assessing needs, thus considered by some authors, as the father of needs assessment (Barton, 2011). One of Kaufman's major contributions was his well-known model, the Organizational Elements Model (OEM). Kaufman developed this model from his belief that it was not enough for HPI practitioners to focus only on the traditional levels of results—organizational and individual—but also that they should go further to the societal level, or what he called mega level. Therefore, he developed this model to urge HPI practitioners to look at the impacts of what they do on societies as the highest level of results (Van Tiem et al. 2012). When conducting a result-based NA, the OEM looks at both the ends and the means. When looking at the ends, the model addresses NA in three levels, social (mega), organizational (macro), and individual (micro). In the second part, the model addresses the means in two levels of activities and process, and Kaufman names this as quasi-needs assessment. So, the OEM has five levels, three addressing the ends and two addressing the means (Kaufman & Guerra-López, 2013).

Kaufman (2003) highlighted the relationship between the OEM and NA stating that the OEM "provides a framework for NA at three levels and places quasi-needs as subordinate."

Description of the model

In his book *Strategic planning plus: An* organizational *guide*, Kaufman identified and described in nine steps a result-based model for NA. The author emphasized that these nine steps will help assessors and performance improvement consultants to "Identify needs (as gaps in results), place the needs in priority order, select the most important ones for resolution, and assure that important others agree on both the needs and the importance of dealing with each" (Kaufman, 1991). Table 3 illustrates the nine steps/tasks with a brief explanation of each.

Table 3

Kaufman's Model.

Main tasks	Explanations
1. Decide to plan using data from a needs assessment.	This is different from simply asking people what they want or merely accepting existing goals, objective, and methods. Remember the importance of a proactive needs assessment, rather than simply looking to make current efforts and results more efficient.
2. Select the needs assessment (and planning) level to be used: Micro, Macro, or Mega.	
3. Identify the actual needs assessment and planning partners groups.	This is done both to obtain useful input and to get the significant others involved in the process and consequences of planning. The three partner groups … include implementors (those who develop and deliver interventions), recipients (managers, executives, trainees, custodial workers, or whoever is intended to receive the intervention), and society/clients/community (those external to the organization who will be affected by the success or failure of our planning). In addition to these "live" partners, there should be a data-based "partner": objective indicators of self-sufficiency, self-reliance, positive client and social impact (such as customer satisfaction, profits, toxic pollutants, or safety).
4. Obtain the participation of your needs assessment partners.	Clearly state what the partners will be supplied, be asked to do, and actually produce. In addition, be very clear about how what they deliver will be used.

5. Obtain acceptance of the needs assessment (and planning) frame of reference: Mega, Macro, or Micro.	Agreement on the level of the needs assessment is essential. Instead of seeking only to improve current operational efficiency, obtain commitment to a proactive approach.
6. Collect data on both external (outside the organization) needs and internal (within the organization) needs.	Both "hard" data (controlled, externally verifiable, performance observations) and 'soft" data (private perceptions and individual awareness of needs) should be collected and used. Also collect information concerning future realities, requirements, trends, and issues.
7. List the identified, documented, and agreed-upon needs (the gaps in results between what is and what should be)…	Agreement among the partners should be obtained at this stage. Look for and eliminate any conflicts between needs suggested by hard data and those based on soft data. People's perceptions and external performance data should agree. If you find a conflict, dig deeper in order to confirm or deny a need that is not confirmed by both types of data.
8. List documented needs to be resolved (problems) in order of their importance; reconcile disagreements among the partners.	To reach agreement on a priority of problems, determine the cost of meeting each need and compare it with the cost of ignoring the need. Partners should agree on the priority order because they believe that the ranking is "right," not because they want to avoid conflict; don't back off from the required rigor and precision, and don't change from the focus on ends.

9. List selected problems (needs selected for closure) to be resolved and obtain agreement of partners.

Note: based on Kaufman, R. A. (1991). Strategic planning plus: An organizational guide. Glenview, Ill: Scott, Foresman.

d. Robinson and Robinson's Model

Overview:

In the 1995 *Performance consulting: Moving beyond training* Robinson and Robinson developed and illustrated a model they called the performance relationship map to be used for identifying and assessing four types of needs: business, performance, training, and work environment. The authors indicated that due to the fact that management can be best influenced

when illustrating "how actions being proposed will have a positive effect on the business, to do this [performance consultants] must be able to illustrate the interrelationship between business goals, performance requirements, training, and work environment needs" (Robinson & Robinson, 1995). The authors have developed and used their model (performance relationship map) in order to provide both performance consultants and clients with a mean that would help them to understand the complexity of human performance. According to Leigh et al. (2000), Robinson & Robinson's model "emphasizes both training and nontraining solutions to individual and team performance discrepancies, and advocates involving a wide variety of stakeholders in defining performance problems."

Description of the model:

As illustrated in Robinson & Robinson (1995), their NA model has six main components. Table 4 illustrate the six main tasks/components with a brief explanation of each.

Table 4

Robinson & Robinson's Model.

Main tasks	Explanations
1. The identification of a business need and its business strategies.	[This identification] comes from information obtained from the client team [which] made up of the people who are accountable for the business results [as well as] the people who can assist in or otherwise impact upon the achievement of those business results.
2. Obtain relevant data on operational results.	Operational results are the measure the client teams use to track their progress toward achieving their business needs and goals… the source of these data is a client team.
3. Once the desired operational result are clear, [performance consultants] move to the identification of SHOULD performance.	In other words, what do successful performance do to achieve these results?... SHOULD information is collected through one-on-one interviews, focus group interviews, direct observation, documentation reviews, and literature reviews. As performance consultants, [performance consultants] analyze the information, bring it back to [their] clients, and present it so [their] clients can visualize not only the performance but its linkage to the operational results.

4. Once the client team has agreed to the desired future SHOULD performance, [performance consultants] then move to the next step of determining what is actually happening with current performance.	In this step, [performance consultants] want to obtain a picture of the typical performer. This typical performance is the best description of the actual performance within the organization. [Their] data sources can be the performers, their bosses, their employees (if they have direct re- ports) and customers (if they have customers). With large numbers of people, [performance consultants] will typically obtain data by questionnaire. With smaller groups, [performance consultants] may use a combination of questionnaire and interview in certain situations [performance consultants] may use direct supplemented by documentation review.

5. Once these observation data are collected, [performance consultants] are able to determine the performance gap.

6. Environmental Factors.	While [performance consultants are] collecting both the SHOULD and IS performance, [performance consultants] will concurrently be collecting CAUSE data about the performance gap from the same data sources, using the same data methods. Thus, [performance consultants] are continually obtaining this information in [their] data collection process. The information is then analyzed prior to a meeting with the client team. During [their] meeting with [their] clients, [performance consultants] are able to present the data clearly and talk about options for meeting the business need originally discussed with [their] client group.

Note: Based on Robinson, D. G. & Robinson, J. C. (1995). Performance consulting: Moving beyond training. San Francisco: Berrett-Koehler.

e. Rothwell and Kazanas's Model

Overview:

A seminal work written by Rothwell and Kazanas was *Mastering the instructional design process: A systematic approach*. The book was originally published in 1992 and has had a number of editions over the years. In this book, the authors expanded their views on a holistic model of Instructional System Design (ISD) model. One essential step of the model they discussed was NA emphasizing that "needs assessment is usually the first step in the ISD model…[and] all subsequent steps in the ISD model depend on its results" (Rothwell & Kazanas, 2004). This model

can be used as a very useful guideline for conducting NA especially in developing management and implementation plans (Leigh et al. 2000). According to Watkins et al. (1998) "Rothwell & Kazanas model relies on two main assumptions. First, the authors presuppose that intended results will necessarily follow from individual and small group application of skills. Second, they assume that instructional goals possess the rigor necessary for decision making, and will contribute to individual, small group, organizational, and societal consequences."

Description of the model:

In their NA model, Rothwell and Kazanas have identified seven major steps designed to close gaps in performance. Table 5 illustrates those seven steps with a brief explanation and/or guiding questions for each.

Table 5

Rothwell and Kazanas's Model.

Main tasks	Explanations/Guided questions
[1] Establishing objectives of a Needs Assessment	Needs assessment objectives spell out the results sought from needs assessment… They reduce the chance that instructional designers might get sidetracked studying tangential issues during the assessment process. In addition, they also clarify why the problem is worth solving and what the ideal outcome(s) will be. To establish needs assessment objectives, designers should begin by clarifying what results are to be achieved from the needs assessment. This is a visioning activity that should produce a mental picture of the desired conditions existing at the end of the assessment process.
[2] Identifying the Target Audience	Whose instructional needs are to be addressed in solving the performance problem? Who must be persuaded by the results of needs assessment to authorize instructional projects and provide resources for carrying them out? … needs assessment really has at least two target audiences…: [a] Performers: employees whose instructional needs will be identified through the needs assessment process. They correspond to subjects in a research project. Any needs assessment will have to identify who is presently affected by the performance problem, how much they are affected, and where they are located… [b] Decision makers are the individuals whose support will be crucial if the needs assessment plan is to be carried out successfully…It is essential

to identify who will receive results of the needs assessment, because their personal values and beliefs will affect interpretation of the results.

[3] Establishing Sampling Procedures	Instructional designers commonly use any of four types of sampling procedures: (1) convenience or judgmental sampling. (2) simple random sampling, (3) stratified sampling, and (4) systematic sampling. To determine designers should consider the objectives of which one to use, instructional the needs assessment, the degree of certainty needed in the conclusions, the willingness of decision makers in the organization to allow information to be collected for the needs assessment study, and the resources (time, money, and staff) available.
[4] Determining Data Collection strategy and Tactics	How will information about instructional needs be collected? Answer this question in the needs assessment plan, making sure that the data collection problem methods chosen are appropriate for investigating the performance… Five methods are most often used to collect information about instructional needs: (1) interviews, (2) direct observation measures of work (3) indirect examinations of performance or productivity measure (4) questionnaires, and (5) task analysis.
[5] Specifying Instruments and Protocols	What instruments should be used during the needs assessment, and how should they be used? What approvals or protocols are necessary for conducting the needs assessment, and how will the instructional designer interact with members of the organization?
[6] Determining Methods of Data Analysis	How will results of the needs assessment be analyzed once the information has been collected? ... Selecting a data analysis method depends on the needs assessment design corresponding to a research design that has been previously selected. Among them: (1) historical, (2) descriptive, (3) developmental, (4) case/field study, (5) correlation, (6) causal-comparative, (7) true experimental, (8) and (9) action research.
[7] Assessing Feasibility of the Needs Assessment Plan	Before finalizing the needs assessment plan, instructional designers should review it with three important questions in mind: (1) Can it be done with the resources available? How many—and what kind of—people will be required to staff the effort? What equipment and tools will they need? How long will it take to conduct the needs assessment? What limitations on staff, money, equipment, or access to information are likely to be faced, and is the needs assessment plan realistic in light of available resources and likely constraints? (2) Is it workable in the organizational culture? How are decisions made in the organization, and how well does the needs assessment plan take the organization's decision-making processes into account? Whose opinions are most valued, and how well does the needs assessment plan take their opinions into account? How have

organizational members solved problems in the past, and how well does the needs assessment plan take the organization's past experience with problem solving into account?

(3) Has all superfluous information been eliminated from the plan? Superfluous information should be eliminated from the needs assessment plan, needs assessment processes, and reports on the results. The acid test for useful information has to do with the amount of persuasion that is necessary.

Note: Based on Rothwell, W. J. & Kazanas, H. C. (2004). Mastering the instructional design process: A systematic approach. San Francisco: Pfeiffer.

f. Rummler and Brache's Model

Overview:

Rummler was one of the most influential scholars in the field of HPI. Van Tiem et al. (2012) stated that "Rummler's work fundamentally changed our work, our way of thinking, and the way we behave as professionals." Rummler and his colleague, Brache, provided the HPI field with a phenomenal work called *Improving Performance: How to Manage the White Space on the Organization Chart*. In this book, the authors presented a framework that had a fundamental impact on the theory and the practice of the field. According to Rummler and Brache (1995) "the systems view of an organization is the starting point… for designing and managing organizations…; [therefore, this] framework was based on the premise that organizations behave as an adaptive system" Richey et al. (2011) explained that this model "applies a systems view to three levels of performance: the organization level, the process level, and job/performer levels. The model also includes three performance needs: goals, design, and management… the framework combines the three levels of performance with the three performance needs [goals, design, and management] to produce nine variables of performance."

Description of the model:

For assessing and analyzing performance needs in the organization's three levels of performance, Rummler and Brache developed their "Fourteen-step Three Levels Approach" Organization, Process, and Job. In fact, this model or approach can be used for conducting an effective NA projects. However, Rummler & Brache (1995) emphasized that "the heart of the process is the sequence of steps, the questions that need to be answered at each step, the organization of the information obtained in response to the questions, and the link between actions and diagnosis." Table 6 illustrates the fourteen steps with a brief explanation of each task/step.

Table 6

Rummler and Brache's Model.

Tasks (Steps)	Explanations
Step 1: Project defined.	[The goal of this step] is specifically to define the Critical Business Issue (CBI)… During Project Definition, [performance consultant can] take these actions: - Learn the specific financial effect the problem is having on the organization. - Establish project goals based on the desired payout amount. - Define the scope of the project. - Identity [the] client and define the roles he and other key persons will play in the analysis. - Reach some conclusions regarding the constraints, odds of success, and value of the project.
Step 2: Project Plan Developed.	[A performance improvement consultant] plans the events and dates for the project. He/she is careful to indicate the date and data sources he needs at each of the three levels of analysis.
Organization Improvement	
Step 3: Organization System Defined.	[A performance improvement consultant identifies] other factors that may affect claim payouts. He begins his analysis at the Organization Level. His first step is to develop a Relationship Map… at this map of functions, inputs, and output will help him see how his project fits into the big picture and ensure that he has identified all the areas he should probe during his analysis.

Step 4: Organization Performance Improvement Opportunities Identified.	[A performance improvement consultant identifies] high-impact gaps at the organization level. He begins with the focus provided to him by [the client] but is alert to other opportunities.
Step 5: Organization Improvement Actions Specified.	While he/she is gathering his data, [a performance improvement consultant] identifies some of Organization Level causes of the high-impact gaps. Since he realizes that these can be addressed at the organization Level, without exhaustive analysis at the Process and Job/ Performance Levels, he develops a set of recommended actions to address these causes on the basis of the Three Performance Needs at the Organization Level: Organization Goals, Design, and Management.
Step 6: Process with Performance Payoff Identified.	To bridge to the Process Level, [a performance improvement consultant]… investigates the underwriting and new-product development processes… [He also] identifies the [job] handling process as the one with greatest impact on the goals of his project. At this point, he would update his plan, specifying the steps he will take at the Process Level.

Process Improvement

Step 7: Process Defined.	In this step [a performance improvement consultant] works with a group of [performers] representatives and [performers'] supervisors to construct a Process Map, which depicts the claim-handling process as it should flow. (In many instances, this type of group first needs to document the 'is' process as a backdrop for the creation of the "should").
Step 8: Process Performance Improvement Opportunities Identified.	Having documented the claim-handling process, [a performance improvement consultant] identifies the desired performance for each process step, the actual performance, any gaps between desired and actual performance, and the impact of those gaps.

Step 9:	[A performance improvement consultant] identifies the
Process Improvement Actions Specified.	causes of gaps revealed in step 8 and the process improvement actions that will remove the gaps… [He] finds causes that require clarifying performance expectations and providing feedback.
Step 10:	As the last step in Process Improvement and a bridge to Job
Job(s) with Performance Payoff Identified.	Improvement, [a performance improvement consultant] identifies the jobs that contribute to the process steps in which there are gaps.

Job Improvement

Step 11:	[A performance improvement consultant] and a group of
Job Specification Defined.	[performers'] supervisors and managers define the outputs and standards that the "should" process requires of the [performers'] Supervisor job…
Step 12:	The Job Model produced in Step 11 describes the
Job Performance Improvement Opportunities Identified.	performance that the [performers'] supervisor needs to produce. In step 12, [a performance improvement consultant] compares the current performance to the Job Model's standers and identifies gaps, the impact of the gaps, and the causes of the gaps.
Step 13:	For each gap, [a performance improvement consultant]
Job Improvement Actions Specified.	develops a recommended gap-closing action… His action development is focused on the causes of the gaps.

Implementation

Step 14:	In this final step in the process, [a performance improvement
Performance Improvement Actions Implemented and Evaluated.	consultant] summarizes the recommendations from all three levels of his analysis… He conducts a cost-benefit analysis on the recommendations and develops a proposed high-level implementation plan.

Note: Based on Rummler. G. A., & Brache, A.P. (1990). Improving performance: How to manage the white space on the organization chart. San Francisco: Jossey-Bass.

g. Witkin and Altschuld's Model

Overview:

Witkin and Altschuld published a phenomenal book called *Planning and conducting needs assessment: A practical guide* in 1995. The authors indicated that their aim was to develop "a three-phase model for assessing needs, an extensive treatment of NA methods, and the causal analysis" (Altschuld & Witkin, 2000). The model they developed, as noted by Hernández-plaza, Pozo & Alonso-Morillejo (2004), was aligned with most NA models that intended to first describ and prioritize needs and then collect and analyze data in order to determine the cause and solution of the problem or fulfilling the needs. According to Watkins et al. (1998), Witkin and Altschuld's NA model can be considered an "action-plan framework" and "a reactive model" meaning that the model addressees current and future problems but does not deal with creating future opportunities. Moreover, this model tends to focus on "process improvement and the achievement of the organization's goals for individuals and small groups" (Watkins et al. 1998).

Description of the model:

Witkkin and Altschuld developed what they called A Three-Phase Plan for Assessing Needs. The three phases of the model "occur in sequence, and each phase concludes with a written product. The boundaries between them are not fixed; however, they merely suggest a time progression of a given set of tasks" (Witkkin & Altschuld, 1995). Table 7 illustrates the three main phases of the model and the tasks required for each phase.

Table 7

Witkkin and Altschuld's Model.

NA phases	Required tasks	Outcomes

PHASE 1: Preassessment (exploration)	• Set up management plan for NA
	• Define general purpose of the NA
	• Identify major need areas and/or issues
	• Identify existing information regarding need areas
	• Determine:
	    ○ Data to collect
	    ○ Sources
	    ○ Methods
		Preliminary plan for Phases 2 and 3, and plan for evaluation of the NA

	o Potential uses of data	
PHASE 2: Assessment (data gathering)	• Determine context, scope, and boundaries of the NA • Gather data on needs • Set preliminary priorities on need—Level 1 • Perform causal analyses at Levels 1, 2, and 3 • Analyze and synthesize all data	Criteria for action based on high-priority needs
PHASE 3: Postassessment (utilization)	• Set priorities on needs at all applicable levels • Consider alternative solutions • Develop action plan to implement solutions • Evaluate the NA Communicate results	Action plan(s), written and oral briefings, and reports

Note: Based on Witkin, B.R. & Altschuld, J. W. (1995). Planning and conducting needs assessment: A practical guide. Thousand Oaks. CA: Sage.

3. Analyzing and synthesizing needs assessment tasks

There is a variation among NA models in terms used for explaining/presenting how NA should be conducted. For example, some authors used the term 'tasks'; others used 'phases'; some preferred 'steps'; and some others 'components'. Consequently, in the current study, the researcher used the term 'task' to represent a single operation that should be conducted as an essential part of NA as a whole process. Table 8 aligns the seven NA models and the key tasks of each.

Table 8

NA models and the key tasks of each one.

NA model	Key NA tasks
Burton & Merrill	Phase 1. Identity a Broad Range of Possible Goals Phase 2: Rank Goals in Order of Importance Phase 3. Identify Discrepancies Between Desired and Actual Performance Phase 4. Set Priorities for Action
Hannum & Hansen	1. Respond to request for training assistance. 2. Negotiate assessment plan 3. Collect data on overall problem. 4. Analyze incidence of problem. 5. Determine probable cause(s) of performance gaps.

6. Prioritize identified training needs.

Kaufman	1. Decide to plan using data from a needs assessment.

2. Select the needs assessment (and planning) level to be used: Micro, Macro, or Mega.
3. Identify the actual needs assessment and planning partners groups.
4. Obtain the participation of your needs assessment partners.
5. Obtain acceptance of the needs assessment (and planning) frame of reference: Mega, Macro, or Micro.
6. Collect data on both external (outside the organization) needs and internal (within the organization) needs.
7. List the identified, documented, and agreed-upon needs (the gaps in results between what is and what should be)
8. List documented needs to be resolved (problems) in order of their importance; reconcile disagreements among the partners.
9. List selected problems (needs selected for closure) to be resolved and obtain agreement of partners.

Robinson & Robinson
1. The identification of a business need and its business strategies.
2. Obtain relevant data on operational results.
3. The identification if SHOULD performance
4. Determining what is actually happening with current performance.
5. Determine the performance gap.
6. Environmental Factors.

Rothwell & Kazanas
[1] Establishing objectives of a Needs Assessment
[2] Identifying the Target Audience
[3] Establishing Sampling Procedures
[4] Determining Data Collection Strategy and Tactics
[5] Specifying Instruments and Protocols
[6] Determining Methods of Data Analysis
[7] Assessing Feasibility of the Needs Assessment Plan

Rummler & Brache
Step 1: Project Defined.
Step 2: Project Plan Developed.

Organization Improvement

Step 3: Organization System Defined.
Step 4: Organization Performance Improvement Opportunities Identified.
Step 5: Organization Improvement Actions Specified.
Step 6: Process with Performance Payoff Identified.

Process Improvement

Step 7: Process Defined.

Step 8: Process Performance Improvement Opportunities Identified.
Step 9: Process Improvement Actions Specified.
Step 10: Job(s) with Performance Payoff Identified.

Job Improvement

Step 11: Job Specification Defined.
Step 12: Job Performance Improvement Opportunities Identified.
Step 13: Job Improvement Actions Specified.

Implementation

Step 14: Performance Improvement Actions Implemented and Evaluated.

Witkin & Altschuld	PHASE 1: Preassessment (exploration)

PHASE 1: Preassessment (exploration)

- Set up management plan for NA
- Define general purpose of the NA
- Identify major need areas and/or issues
- Identify existing information regarding need areas
- Determine:
  - Data to collect
  - Sources
  - Methods
  - Potential uses of data

Outcomes:

Preliminary plan for Phases 2 and 3, and plan for evaluation of the NA

PHASE 2: Assessment (data gathering)

- Determine context, scope, and boundaries of the NA
- Gather data on needs
- Set preliminary priorities on need—Level 1
- Perform causal analyses at Levels 1, 2, and 3
- Analyze and synthesize all data

Outcomes:

Criteria for action based on high-priority needs

PHASE 3: Postassessment (utilization)

- Set priorities on needs at all applicable levels
- Consider alternative solutions
- Develop action plan to implement solutions
- Evaluate the NA Communicate results

Outcomes:

Action plan(s), written and oral briefings, and reports.

The NA models discussed above have shown many similarities in terms of the tasks for conducting NA. In the current study, the task was considered a common task if it has been addressed in three or more models. If the task was addressed in only two of the aforementioned NA models, the task was realized in this study but not considered as a common NA task. If the task was discussed in only one model, the task then would not be mentioned in this study. Table 9 below shows the NA tasks that have been addressed in two or more models; each task was aligned with the models that it has been addressed in.

Table 9

Aligning each common task of NA and the models that indicate it.

NA Task	Models
Developing plan for NA	Hannum & Hansen Kaufman Rothwell and Kazanas Rummler and Brache Witkin and Altschuld
Determining NA level of result	Kaufman Rummler and Brache
Identifying NA's purpose(s), goal(s), and objective(s)	Burton and Merrill Rothwell and Kazanas Rummler and Brache Witkin and Altschuld
Collecting data, including: type, participants, sources, instrument(s), analysis	Hannum & Hansen Kaufman Robinson and Robinson Rothwell and Kazanas Rummler and Brache Witkin and Altschuld
Identifying the desired performance (What should be)	Burton and Merrill Kaufman Rummler and Brache
Identifying the current performance (What is)	Burton and Merrill Kaufman Robinson and Robinson Rummler and Brache

Determining need(s) or the gap(s) in performance	Kaufman Robinson and Robinson Rummler and Brache
Prioritizing gaps/needs based on specific criteria (e.g. urgency, cost of closing vs. ignoring, etc.)	Burton and Merrill Hannum & Hansen Kaufman Witkin and Altschuld
Determining the cause(s) of the gap(s) in performance	Hannum & Hansen Rummler and Brache Witkin and Altschuld
Evaluating Needs Assessment	Rummler and Brache Witkin and Altschuld

As shown in Table 9, there were eight tasks for NA that have been addressed in three or more models; therefore, these eight tasks will be considered as common tasks of NA. These tasks were:

- Developing plan for NA

- Identifying NA's purpose(s), goal(s), and objective(s)

- Collecting data, including: type of data, participants, sources, instrument(s), analysis

- Identifying the desired performance (What should be)

- Identifying the current performance (What is)

- Determining need(s) or the gap(s) in performance

- Prioritizing gaps/needs based on specific criteria (e.g. urgency, cost of closing vs. ignoring, etc.)

- Determining the cause(s) of the gap(s) in performance

In fact, occurrence and sequence of NA tasks can be divided into three main phases: Pre-Assessment, Assessment, and Post-Assessment, as identified by Witkin & Altschuld (1995). Therefore, the researcher used these three main phases as criteria for merging and synthesizing the aforementioned eight tasks. In other words, the eight common tasks can be merged in fewer tasks if the occurrence and the sequence of tasks is considered. So, looking in-depth at these eight tasks

shows that some of them can be merged to form one task; thus, the eight tasks can be synthesized and combined into four major tasks. The combined four tasks were considered in the current study as key NA tasks. These four key tasks were:

Task 1: Developing a plan for NA, including but not limited to, the identification of Needs Assessment's goal(s), objective(s), stakeholders, timeline, and the level(s) of result (Mega/Social, Macro/Organizational, and/or Micro/Departmental).

Task 2: Collecting data about the desired performance (What should be) and the current performance (What is), including but not limited to, type of data, participants, sources, instrument(s), and analysis.

Task 3: Determining the actual need or the gap in performance by comparing the current status (What is) to (What should be) status. If there is more than one need/gap, the needs/gaps are prioritized based on specific criteria.

Task 4: Determining the cause(s) of the performance gap(s) and recommending action(s) or solution(s) for addressing the determined cause(s).

Based on the criteria identified above, the key tasks are assigned as follow: Task 1 occurs in the preassessment phase, Tasks 2 & 3 occur in the assessment phase, and Task 4 occurs in the postassessment phases. Table 10 illustrates the alignment between each phase and the assigned key NA task(s).

Table 10

NA phases and the task(s) required in each phase.

NA Phase	Key NA Task(s)
Pre-Assessment	**Task 1**: Developing a plan for Needs Assessment, including but not limited to, the identification of Needs Assessment's goal(s), objective(s), stakeholders, timeline, and the level(s) of result (Mega/Social, Macro/Organizational, and/or Micro/Departmental).

Assessment	**Task 2**: Collecting data about the desired performance (What should be) and the current performance (What is), including but not limited to, type of data, participants, sources, instrument(s), and analysis. **Task 3**: Determining the actual need or the gap in performance by comparing the current status (What is) to (What should be) status. If there is more than one need/gap, the needs/gaps are prioritized based on specific criteria.
Post-Assessment	**Task 4**: Determining the cause(s) of the performance gap(s) and recommending action(s) or solution(s) for addressing the determined cause(s).

4. Human performance and the impacting factors.

Needs assessment by nature is a performance or a behavior done by a human. It is also a performance improvement activity usually takes place at the beginning of any performance improvement project. So as it affects some activities that depend on its results (Rothwell & Kazanas, 2004), it is also affected by many factors that exist in the surrounding environment where the NA is being conducted. This part of the literature review addresses different points of views associated with the factors that positively or negatively impact human performances/activities in general, and NA as one of those activities. However, the term "human performance" is a very general term, so before addressing the factors influencing human performance, it is necessary to define human performance and determine what type of human performance NA belongs to. In fact, Dombrowski & Evers (2014) admitted that human performance is a very complex term to be addressed, and they suggested that human performance is "a multidimensional concept. It can be distinguished between task, contextual and adaptive performance. Each of these dimensions is considered complex in itself." Where:

Task performance describes the degree, in which a work person completes the

job tasks, (e.g.) the quantity and quality of assembled parts. Contextual

performance refers to effort, initiative or enthusiasm that an employee shows beyond his formal job description. Adaptive performance names the extent, in which an employee generates new and innovative ideas or is flexible and open-minded to new tasks and technologies.

The authors divided human performance into two categories: capabilities and the disposition. Capabilities refer to "the sum of all individually available conditions for generating performance" and it is divided into two types: (a) attributes (e.g. age) and (b) acquired knowledge and skills (e.g. level of education). In fact, these two types are not literally performance; however, they can be considered as the prerequisites for performance. The disposition category also has two types: (a) physiological (e.g. hormone variations) and (b) psychological (e.g. work conditions). Figure 1 illustrates these two categories with more examples.
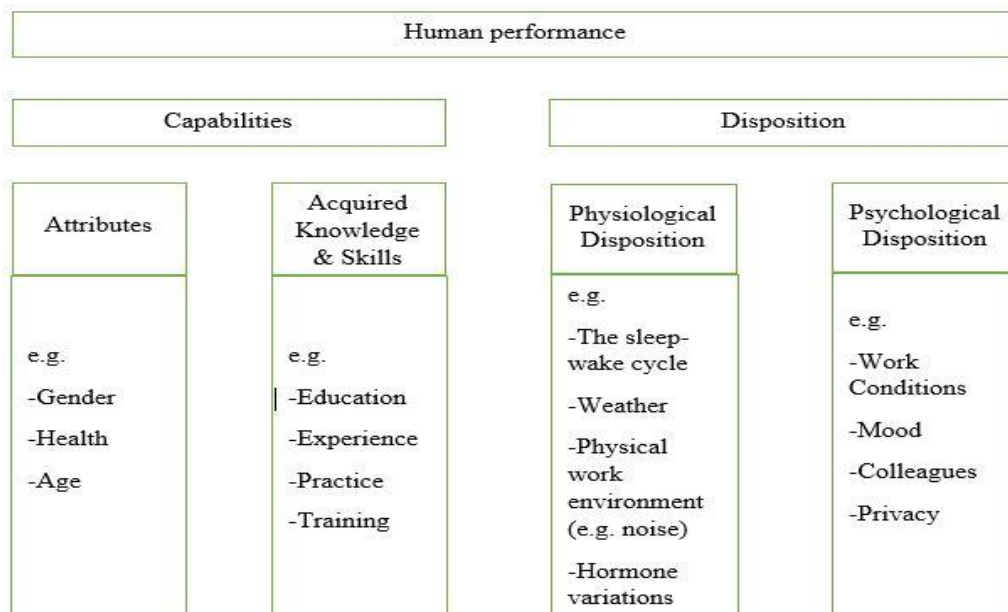
Figure 1: Human performance types.

Source: adapted from "Approach for determining the ideal workload of employees" by Dombrowski, U., & Evers, M., 2014, In Engineering, Technology and Innovation (ICE), 2014 International ICE Conference. IEEE

In relation to NA, the researcher believes that NA can be addressed as related to two types of the aforementioned types, one from each category. So from the first category, it can be addressed by looking at acquired knowledge and skills, and from the second category it can be addressed looking at the physiological components. Therefore, as part of human performance, the current study will address NA tasks based on this determination looking at the frequency of each task as well as the factor impacting each one.

The reason for studying and caring about the factors impacting human performance was not only to know and list the positive and negative effects on the performance but also, as Farcasiu & Prisecaru (2012) concluded, to help organizations in the identification of corrective actions in any given operation. Since human performance is varied based on many variables, the factors influencing performance are varied as well. Therefore, HPI practitioners should be aware of the factors impacting human performance because awareness of those factors will contribute to managing and controlling the consumption of essential resources (time, effort, money, etc.) needed for any project (Harriott & Adams, 2013). In relation to the Instructional Design and Technology field, the importance of studying the factors impacting human performance is that the field is advancing from Instructional Design to Human Performance Technology; therefore, "one needs to understand all the factors influencing human performance, so that they could apply them properly to improve the performance" (Bandhana, 2010).

The discussion of the factors influencing human performance was presented in the literature from different perspectives. Robinson & Robinson (1995) stated that "most performance problems result from multiple causes. For individuals to perform successfully, they must have the required skills and knowledge along with a supportive work environment". The authors pointed out some of the factors impacting performance. One major factor the authors have emphasized is

the lack of environmental support of the skills that the employees have been trained on. This includes: wasting a lot of time in doing a lot of unnecessary administrative tasks, the feedback provided by managers that does not help in solving employees' performance problems, and managers' skills that do not help them coach their employees on the required tasks.

In a study that aimed to examine the effect of different factors on task performance, Locke, Frederick, Lee & Bobko (1984) found that "performance is affected by self-efficacy, goals, ability, posttraining ability, and strategies used." Forming a different perspective, Genaidy and Karwowski (2003) demonstrated that human performance in workplaces is affected by different factors, and those factors can be put into two major categories: "(a) factors emanating from the work environment by "acting on" the individual, and (b) factors "experienced by" the individual in the work environment that are the product of the interaction of factors "acting on" the individual and his or her personal characteristics." Genaidy, Rinder, Sequeira & A-Rehim (2009) agreed with Genaidy & Karwowski (2003) on these two main categories of factors proposed and explained that "acting on work environment factors consist of the following variables: (a) organizational environment (b), technological environment (c), physical environment (d), economic growth (e), individual growth, (f) social/communication environment, (g) mental task content, and (i) physical task content. The experienced factors include: (a) effort, (b) perceived risk/benefit, (c) performance (d) psychological impact."

In a research paper that described a theory called the fundamentals of Work System Compatibility (WSC) which was used to comprehensively evaluate and improve performance, Genaidy, Karwowski & Shoaf (2002) specified "the hierarchy of work factors impacting human performance" at the job level. The authors described two levels of factors impacting human performance: "global factors (i.e. organizational factors impacting all jobs in the work system and

process factors impacting only the group of jobs that make up the process across one or more functions) as well as local factors (i.e. factors existing only at the job level)." Another point of view was proposed by Kosmowski (1995); the author classified the factors impacting human performance into three levels: (a) external factors, "those which are outside the individual"; (b) internal factors, "those that can be activated within the individual himself"; and (c) stressors, "psychological and physiological." Harriott & Adams (2013) agreed with Kosmowski (1995) on some of these factors and pointed out three categories of factors/variables affecting human performance: "environmental variables (e.g., weather, ambient noise), stressors (e.g., fatigue), task demands (e.g., multitasking, workload), and associated behavioral implications." According to the literature review done by Dombrowski & Evers (2014), the factors influencing human performance were classified in three major categories "individual, (e.g.) gender or age, physical environment, (e.g.) noise level, and organizational environment, (e.g.) shift patterns or training."

Moreover, the factors impacting the human performance as related to a specific field or function have been widely discussed in the literature. For NA, Rothwell & Kazanas (2004) proposed specific factors that negatively/positively affect the conduct and use of NA. Some negatively-affecting factors were: managers' misconception or lack of understanding of needs assessors' roles, managers not putting enough trust on the needs assessor believing that they do not have enough knowledge/skills about the work where NA being conducted; it is believed by some managers that NA takes a very long time, so it is going to hinder the change process especially in dynamic situations. On the other hand, the authors indicated some of the positively-affecting factors such as developing a clear plan, insuring the participation of key decision makers, selecting appropriate tactics that ensure implementation success, and seeking information from

many employees/participants as possible which ensures the effectiveness of the solution/intervention provided as a result of NA.

Similarly, Witkin & Altschuld (1995) mentioned "key factors in conducting NA". The authors listed six factors they believed were important for conducting a successful NA; these factors were: ensuring the wide range of stakeholders participation, selecting the appropriate data collection mean, considering the values of the target audience, considering political factors as NA is a participation-based process; and NA is a decision-making process not mere data gathering. Guerra-López (2008) discussed some factors that affect the application of one similar activity to NA which was evaluation; those factors were getting buy-in from the project's internal and external stakeholders, ensuring the stakeholders' commitment and participation, and considering stakeholders' fears, level of trust and partnership between the evaluator and the client.

In fact, looking closely at the aforementioned grouping and classifying the factors impacting human performance in general and NA as one of the human performance activates, one can infer that those factor are related to two major categories: environmental/organizational factors and human/individual factors. One of the well-known models in the HPI field that addresses these two major categories is the Behavioral Engineering Model (BEM) proposed by Gilbert. In fact, the BEM was widely used by many HPI as a tool for analyzing and improving human performance (Kaufman & Guerra- López, 2013). In addition, Crossman (2010) recognized the BEM as a simple, attractive, and adaptable tool which makes this model applicable for different workplaces.

Gilbert published the BEM in 1978 in his remarkable book, *Human competence: Engineering worthy performance*. In this book, Gilbert identified six factors in which human behavior/performance is affected and organized them in two main categories in which there were three factors under each one. The first category was identified as "Environmental support"; and

the three factors impacting performance belong to this category were data, instruments, and incentives. The second category was identified as "Person's repertory of behavior"; and the three factors impacting performance which belong to this category were knowledge, capacity, and motives (Gilbert, 1978). In fact, Gilbert used very general terms in demonstrating the six factors in which a term could have different meanings to different people. Therefore, in order to simplify these factors toward a better understanding of these factors, Van Tiem et al. (2012) and Richey et al. (2011) perceived these six factor as follows:

  A- Environmental supports factors:

   A1. Data: Information

   A2. Instruments: Resources

   A3. Incentives: Rewards

  B- Individual repertory factors:

   B1 Knowledge: Knowing how to perform

   B2. Capacity: Physical and intellectual ability

   B3. Motives: Willingness to work

For more in-depth simplification of these six factors, Kaufman & Guerra- López (2013) provided detailed example questions under each factor as illustrated in Table 11.

Table 11

The Behavioral Engineering Model with detailed example questions.

	SD Information	R Instrumentation	Sr Motivation
E Environmental supports	<u>Data</u> • Are roles and Performance expectations clearly defined?	<u>Instruments</u> • Do they have materials tools and time to do job? • Are process and procedures clearly	<u>Incentives</u> • Are there adequate financial incentives made contingent upon performance?

	• Are employees given relevant and frequent feedback about the adequacy of their performance? • Do they have descriptions of what performance is expected? • Are there clear and relevant guides to adequate performance?	defined and enhance performance, if followed? • Is the work environment safe and supportive? For example, organized, safe, clean, etc.?	• Are nonmonetary incentives made available based on performance? For example, career development opportunities? Recognition and encouragement? Are jobs enriched to fulfill the needs of employees themselves?
P Person's repertory of behavior	<u>Knowledge</u> • Do they have the right sets of skills and knowledge to do the job? Do they have proper training to do the job? • Are employees placed in the right job? • Are employees cross-trained to understand each other's jobs?	<u>Capacity</u> • Do employees have the innate physical, mental, and emotional capabilities to do the job? • Were they properly selected for the job, based on their demonstrated past accomplishments?	<u>Capacity</u> • Do you understand what motivates people to work or not work? • Do you know if they have the internal desire to do the job? • Were they properly selected for the job, based on their own personal goals?

Source: Kaufman, R., & Guerra-López, I. (2013). Needs assessment for organizational success. Alexandria, VA: American Society for Training and Development.

Since the current study focuses on the prevalence of each key task of NA, the BEM model is used as a framework for determining the factors that impact each task while conducting NA. In addition, the six factors that impact performance according to the BEM are studied in relation to each task separately in order to explore the provision/possession of each factor when conducting each key task and the importance of each factor to each key task.

Summary

In this chapter, four sections have been addressed, an introduction, introducing seven models of NA, the analysis and synthesis of NA tasks, human performance, and the factors that

impact human performance. The following chapter, Chapter Three, addresses the methodology of the current study.

CHAPTER 3 METHODOLOGY

This chapter explains the research design and procedures that were used in this research. Seven main components are discussed: the purpose of the study, research questions, sample, research design, instrumentation, data analysis, data collection procedures.

1. Purpose

The purpose of the current study was to explore the prevalence of using key needs assessment tasks by HPI practitioners when conducting NA. This study also aimed to explore the factors that impact the conduct of each task of NA as they are perceived by HPI practitioners. Each factor was examined in two variables the provision/possession of each factor when conducting each key task, and the importance of each factor to each key task.

2. Research questions

The two main questions which guided the current study were:

1- What is the frequency of using each key needs assessment task by Human Performance Improvement practitioners?

2- What are the factors that impact the use of each key needs assessment task as they are perceived by Human Performance Improvement practitioners?

3. Sample

The participants of this study were HPI practitioners who were familiar with conducting NA whether having fully or partially participated in conducting it. Since there was an unknown number of HPI practitioners in workplaces, the sampling framework the researcher used was the total number of memberships of one well-known and leading association that is recognized and considered home to many practitioners in the field of HPI, the International Society for Performance Improvement (ISPI). According to ISPI's website, the association was founded in

1962 and is "the leading international association dedicated to improving productivity and competence in the workplace. ISPI represents performance improvement professionals throughout the United States, Canada, and 44 other countries". The estimated number of ISPI memberships about 4000 as of the beginning of 2015.

A convenience sampling was used as a sampling strategy for collecting data from participants. According to Given (2008) "A convenience sample can be defined as a sample in which research participants are selected based on their ease of availability. Essentially, individuals who are the most ready willing, and able to participate in the study are the ones who are selected to participate." Consequently, all HPI practitioners who were members of ISPI, (International chapter and Michigan chapter) as well as the researcher's own list of emails that included participants whom he knew were HPI practitioners had the same opportunity to participate in completing an electronic questionnaire/online survey. The survey was sent to participants through email as a mean for communicating with participants who were easily available.

The approval of this study was granted by the Institutional Review Board (IRB) at Wayne State University (Appendix G). After the approval had been granted, the data was collected between February, 2016, and April, 2016. Of the sample (N = 110), however, 14 participants did not provide valid answers for any task even though they agreed to participate in the study. Therefore, those 14 participants were excluded, so the new total number of participants was (N=96). 81 hold doctorate or master's degrees (84.4%). 75 indicated that their degrees were related to learning and performance improvement (78.1%). 93 reported that they had studied HPI in academic/professional training courses (96%). 91 indicated that NA was a subject or a part of academic/professional training courses they had taken (94.8%). 78 respondents had been working as HPI practitioners for more than 6 years (81.2%). 81 respondents have been involved in

conducting NA for more than 15 times (84.4%). 70 respondents had conducted NA in 3 or more different organizations (72.9%). Appendix F presents more details.

4. Research design

In order to determine the degree or the frequency to which HPI practitioners perform each task of the four key NA tasks, participants were asked to complete a Likert Scale questionnaire (Appendix C). There were five options: Always=5, Most of the time=4, Sometimes=3, Rarely=2, or Never=1. This is an ordinal scale that shows the numerical difference between data points, and it indicated only that one data point was ranked higher or lower than other points. Similarly, in order to determine the factors that impact the use of each task of NA as they were perceived by HPI practitioners, participants were asked to complete a Likert Scale questionnaire in which six factors were examined in relation to each task (Appendix C). These six factors are: (A1) information, (A2) resources, (A3) incentives, (B1) knowledge, (B2) ability, and (B3) motives. Two variables associated with each one of these were examined: (a) the availability (provision/possession) of each factor while conducting each key task, and (b) the importance of each factor to each key task. There were five options associated with each factor in each variable: The five options associated with the provision of factors A1, A2, and A3 while performing each task were: Always=5, Most of the time=4, Sometimes=3, Rarely=2, or Never=1.

The five options associated with the importance of factors A1, A2, A3, and B3 to perform each task were: Very important=5, Important=4, Not sure=3, Unimportant=2, or Very unimportant=1.

The five options associated with the possession of factors B1, and B3 while performing each task and the importance of factor B1 to each task were: Strongly agree=5, Agree=4, Not sure=3, Disagree=2, or Strongly disagree=1.

Regarding factor B2 (Capacity: Physical and intellectual ability), participants were not asked to provide information about the possession or the importance of this factor because it was taken for granted that the possession of physical and intellectual ability to perform each task was mandatory, and performers must be physically and intellectually capable to perform each task; therefore, participants were asked to provide information regarding their satisfaction about their capabilities in performing each task. The five options associated with this factor in relation to each task were: Strongly agree=5, Agree=4, Not sure=3, Disagree=2, or Strongly disagree=1.

These were ordinal scales that showed the numerical difference between data point, and overall indicated only that one data point was ranked higher or lower than other points. (Appendix C)

5. Instrumentation

An online survey was developed by the researcher to be used as an instrument for collecting data for this study. The survey had two main sections: the first section was about demographic information and had 7 questions (Appendix B). The second section addressed the prevalence of key NA tasks and the factors that impacted the use of each one. This section of the survey was used for answering the two main research questions. So, in the survey, questions 1.1, 2.1, 3.1, and 4.1 were used for answering research question one: What is the frequency of using each key NA task by HPI practitioners? The rest of the survey's questions were used for answering the research question two: What are the factors that impact the use of each key NA task as they are perceived by HPI practitioners? (Appendix C).

Before beginning the survey questions, participants had an opportunity to read brief information about the current study including the title of the study, researcher's name, purpose,

study procedures, and contact information if they wanted additional information, and then they were asked to offer their agreement to be involved in the study. (Appendix A)

Validity

To determine the validity of the instrument in measuring what it was designed to measure, two types of validity were addressed:

1- Content validity: The content validity began from the literature review (Chapter Two). The researcher reviewed several models of NA in terms of comparing and contrasting the tasks of NA used in each one, analyzed them, and then synthesized the common tasks into four key tasks. (The process of analyzing and synthesizing the models was addressed in detail in Chapter Two.) Additionally, to insure the validity of those four key tasks to be considered as key tasks of NA, additional content validation was conducted. Four HPI experts were asked to provide their opinions, suggestions, and/or concerns about considering the four identified tasks as key tasks of NA (Appendix D). The feedback was received from experts and the instrument was updated accordingly.

2- Face validity: A group of HPI practitioners was asked to participate in a pilot study in order to determine the clarity (e.g. wording, easy to grasp, smoothness, etc.) of the survey questions (Appendix E). The participants were given a chance to review the four key tasks of NA and the 12 multiple-choice questions associated with each task. Their job then was to respond to each question and provide feedback about its clarity in the column next to each question. The feedback was received from participants and the instrument was updated accordingly.

Reliability

Reliability refers to the consistency of the instrument in measuring what it's designed to measure. According to Kimberlin & Winterstein (2008), "internal consistency [reliability] gives

an estimate of the equivalence of sets of items from the same test [e.g. intelligence, internet addiction, etc.] The coefficient of internal consistency provides an estimate of the reliability of measurement and is based on the assumption that items measuring the same construct should correlate." However, the instrument of the current study was not intended to measure a specific scale or construct, so the items/questions in the survey were not correlated because they were not representing one thing in their totality. Therefore, measuring the internal consistency 'reliability' of this study instrument does not make much sense.

6. Data analysis

The current study is a quantitative descriptive study; therefore, descriptive statistics (percentages and frequencies) are used in order to draw conclusions from the data collected. All questions in this study instrument (survey) are based on the Likert scale, which is an ordinal scale. Therefore, the percentages and frequencies of responses to each option are used for answering the research questions to determine to what extent each NA task had been performed by HPI practitioners as well as their perceptions pertaining to the provision/possession and importance of each factor impacting the conduct of each NA task.

Additionally, inferential statistics is not used in the current study because of two reasons: First, this study does not incorporating classical hypothesis testing where null hypothesis and alternative hypothesis are formally stated; therefore, no associated results such as p-values, test statistics, and effect sizes are reported. Second, inferential statistics is the analyses used to infer things about a population, and this is not the purpose of the current study. This study is a quantitative descriptive study; therefore, descriptive statistics (percentages and frequencies) are used in order to analyze and describe the data collected, so the study does not compute statistical

significance nor does it conduct any type of inferential tests such as correlations, regression, t-tests, ANOVA, etc. that are used to infer things about a population.

7. Data collection procedures

The data collection methods, the two research questions, data sources, and data analysis are presented in Table 12.

Table 12

Research Questions, Data Collection Methods, Data Sources, and Data Analysis

Research Questions	Data Collection Method	Data sources	Data Analysis Method
1- What is the frequency of using each key needs assessment task by HPI practitioners? 2- What are the factors that impact the use of each key needs assessment task as they are perceived by HPI practitioners?	An online survey was sent by email to ISPI members. They were asked to answer the surveys questions online through Qualtrics. The frequencies and percentages of responses to each option of a five-option Likert scale were used for answering these two questions, so the frequency of using each NA task, and the frequency of each factor impacting the use of each task as well as the importance of each factor were determined.	HPI Practitioners	Evaluation the distribution using the percentages and frequencies of responses to evaluate modal response. The distribution of responses to each option associated with each key task was evaluated in order to find out how often the task was being performed by HPI practitioners when conducting NA. Also, The distribution of responses to each option associated with each factor impacting the use of each key task was evaluated in order to find out how often the factor exists and to what extent the factor is important when conducting each task.

Summary

In this chapter, seven main components were discussed, the purpose of the study, research questions, sample, research design, instrumentation, data analysis, and data collection procedures. The following chapter, chapter 4 presents the results.

CHAPTER 4 RESULTS

This chapter describes the findings from the study and answers the two main research questions: (1) What is the frequency of using each key needs assessment task by Human Performance Improvement practitioners? (2) What are the factors that impact the use of each key needs assessment task as they are perceived by Human Performance Improvement practitioners? It should be noted that the data was collected between February, 2016, and April, 2016. Of the sample (N = 96); however, the total number of responses varied as participant answered the survey questions. Therefore, the missing data was indicated in the results tables associated with each question, and the new total number of participants (N) was reported as shown throughout this chapter.

Findings for Research Question One

In the survey distributed to HPI practitioners, questions 1.1, 2.1, 3.1, and 4.1 (Appendix C) were devoted to answering the first research question. So, for each task participants were asked to determine how often they performed each task when conducting NA. Below is the description of how HPI practitioners responded to these four questions.

Task one:
Developing a plan for NA, including but not limited to, the identification of NA goal(s), objective(s), stakeholders, timeline, and the level(s) of result (Mega/Social, Macro/Organizational, and/or Micro/Departmental).

Question 1.1 in the survey (Appendix C) asked participants how often they perform this task when conducting NA. The results shown in table 13 and figure 2 show that 81.2% (N= 96) of participants reported that they perform this task either always or most of the time. This result shows that the conduct of this task as part of NA is prevalent.

Table 13

The prevalence of performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	46	47.9%	47.9%		
	2	32	33.3%	33.3%		
	3	15	15.6%	15.6%	1.74	.837
	4	3	3.1%	3.1%		
	Total	96	100%	100%		

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely
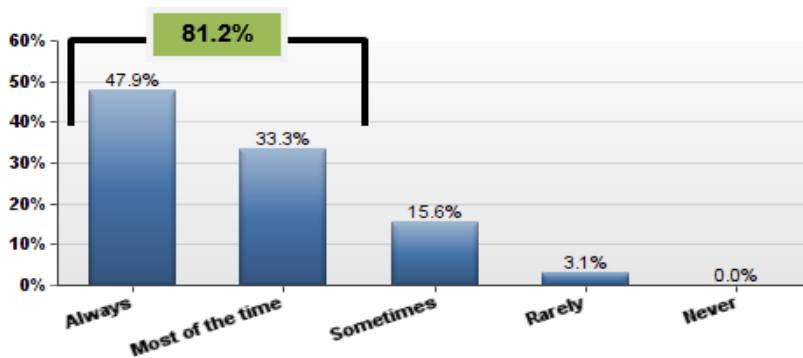
Figure 2: The prevalence of performing task 1

Task two:

Collecting data about the desired performance (What should be) and the current performance (What is), including but not limited to, type of data, participants, sources, instrument(s), and analysis.

Question 2.1 in the survey (Appendix C) asked participants how often they perform this task when conducting NA. The results shown in table 14 and figure 3 show that 90.7% (N= 86) of participants reported that they perform this task either always or most of the time. This result shows that the conduct of this task as part of NA is prevalent.

Table 14

The prevalence of performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	58	60.4%	67.4%		
	2	20	20.8%	23.3%		
	3	7	7.3%	8.1%	1.43	.695
	4	1	1.0%	1.2%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely

Figure 3: The prevalence of performing task 2

Task three:

Determining the actual need or the gap in performance by comparing the current status (What is) to (What should be) status. If there is more than one need/gap, the needs/gaps are prioritized based on specific criteria.

Question 3.1 in the survey (Appendix C) asked participants how often they perform this task when conducting NA. The result shown in table 15 and figure 4 shows that 86.4% (N= 81) of participants reported that they perform this task either always or most of the time. This result shows that the conduct of this task as part of NA is prevalent.

Table 15

The prevalence of performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	50	52.1%	61.7%		
	2	20	20.8	24.7%		
	3	9	9.4%	11.1%	1.56	.837
	4	1	1.0%	1.2%		
	5	1	1.0%	1.2%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never
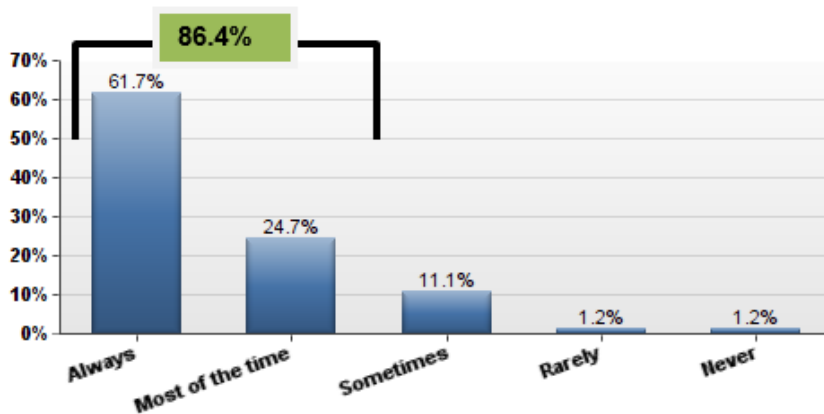
Figure 4: The prevalence of performing task 3

Task four:

Determining the cause(s) of the performance gap(s) and recommending action(s) or solution(s) for addressing the determined cause(s).

Question 4.1 in the survey (Appendix C) asked participants how often they perform this task when conducting NA. The result shown in table 16 and figure 5 shows that 84% (N= 81) of participants reported that they perform this task either always or most of the time. This result shows that the conduct of this task as part of NA is prevalent.

Table 16

The prevalence of performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	42	43.8%	51.9%		
	2	26	27.1%	32.1%		
	3	10	10.4%	12.3%	1.68	.834
	4	3	3.1%	3.7%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely

Figure 5: The prevalence of performing task 4

Findings for Research Question Two

The second research question was: What are the factors that impact the use of each key NA task as perceived by HPI practitioners? In order to answer this question, all questions in the survey (Appendix C) except for questions 1.1, 2.1, 3.1, and 4.1 were devoted to examining the factors that impact the use of each task of NA. As explained in chapter two, six factors have been determined to impact human performance. These factors are placed into two main categories with three factors under each category as follow:

A- Environmental supports factors:

A1) Data: Information

A2) Instruments: Resources

A3) Incentives: Rewards

B- Individual repertory factors:

B1) Knowledge: Knowing how to perform

B2) Capacity: Physical and intellectual ability

B3) Motives: Willingness to work

Each of the above six factors was studied in relation to each task in terms of two variables: (a) the provision/possession of each factor while performing each task, and (b) the importance of each factor for performing each task. However, in regards to factor B2 above, it was taken for granted that the possession of physical and intellectual ability to perform NA tasks is mandatory, and performers must be physically and intellectually capable to perform each task; therefore, the participants were not asked to determine the possession and the importance of this factor, instead they were asked to provide information regarding their satisfaction with their capabilities in performing each task. The following part of this chapter presents the results associated with the second research question addressing one task after another.

Task one:
The factors that impact the use of task one as they are perceived by HPI practitioners were as follow:

A- The environmental supports factors:

Factor A1, Data: Information:

- The provision of factor A1 while performing task 1

Question 1.2 in the survey (Appendix C) asked participants how often the organizations they work with/for provide them with information about their performance while performing task 1, (e.g. feedback about what they are doing and description of what performance is expected of

them). The result shown in table 17 and figure 6 shows that 71.9% (N= 96) of participants reported that organizations either sometimes, rarely, or never provide them with the information needed for better conduct of this task while only 28.1% reported that this factor was always or most of the time provided by organizations. This result shows that the provision of this factor by organizations was not adequately prevalent.

Table 17

The provision of factor A1 while performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	10	10.4%	10.4%		
	2	17	17.7%	17.7%		
	3	28	29.2%	29.2%	3.19	1.199
	4	27	28.1%	28.1%		
	5	14	14.6%	14.6%		
	Total	96	100%	100%		

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never
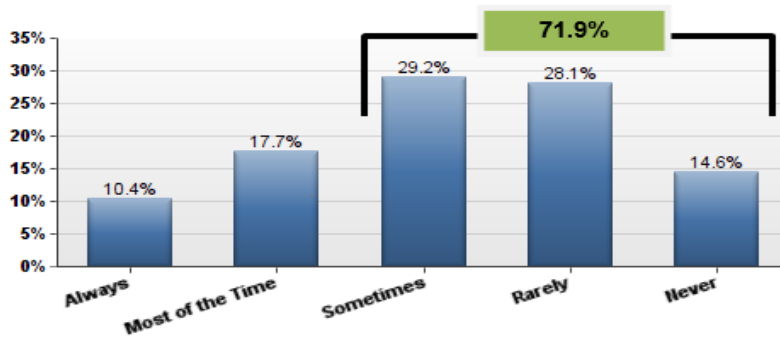
Figure 6: The provision of factor A1 while performing task 1

Question 1.3 in the survey (Appendix C) asked participants about the importance of providing information by the organization while performing task 1. The result shown in table 18 and figure 7 shows that 74% (N= 96) of participants considered this factor as either very important or important for better conduct of this task. This result shows that the provision of this factor could positively impact the conduct of task 1.

Table 18

The importance of factor A1 for performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	26	27.1%	27.1%		
	2	45	46.9%	46.9%		
	3	8	8.3%	8.3%	2.21	1.114
	4	13	13.5%	13.5%		
	5	4	4.2%	4.2%		
	Total	96	100%	100%		

Note. 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant, 5= Very Unimportant
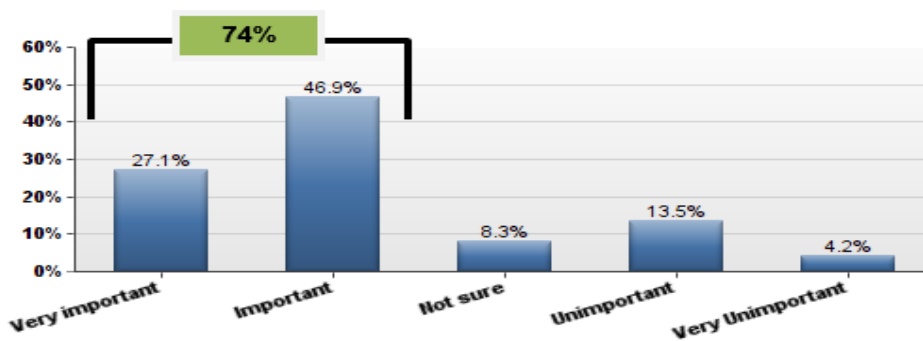
Figure 7: The importance of factor A1 for performing task 1

Factor A2, Instruments: Resources

- The provision of factor A2 while performing task 1

Question 1.4 in the survey (Appendix C) asked participants how often the organizations they work with/for provide them with the resources needed for performing task 1 (e.g. time, additional staff, clear procedures). The result shown in table 19 and figure 8 shows that 57.3% (N= 96) of participants reported that organizations provide this factor either always or most of the time, and 30.2% reported that organizations sometimes provide them with the resources needed for better conduct of this task. This result shows that the provision of this factor by organizations does exist but is not very prevalent.

Table 19

The provision of factor A2 while performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	11	11.5%	11.5%		
	2	44	45.8%	45.8%		
	3	29	30.2%	30.2%	2.48	.951
	4	8	8.3%	8.3%		
	5	4	4.2%	4.2%		
	Total	96	100%	100%		

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never
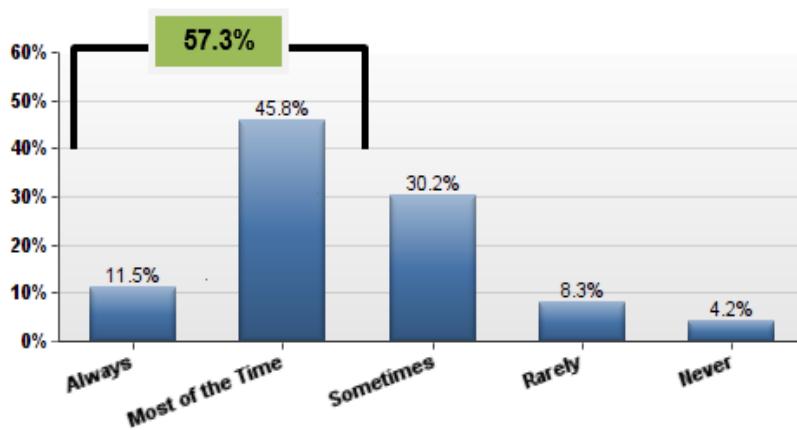
Figure 8: The provision of factor A2 while performing task 1

- The importance of factor A2 for performing task 1

Question 1.5 in the survey (Appendix C) asked participants about the importance of providing the resources by the organization for performing task 1 (e.g. time, additional staff, clear procedures). The result shown in table 20 and figure 9 shows that 93.7% (N= 96) of participants considered this factor as either very important or important for better conduct of this task. This result shows that the provision of this factor could positively impact the conduct of task 1.

Table 20

The importance of factor A2 for performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	58	60.4%	60.4%		
	2	32	33.3%	33.3%		
	3	3	3.1%	3.1%	1.49	.711
	4	3	3.1%	3.1%		
	Total	96	100%	100%		

Note. 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant
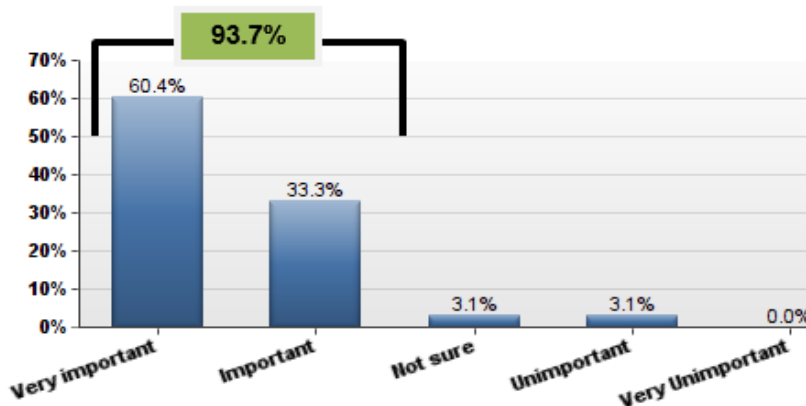
Figure 9: The importance of factor A2 for performing task 1

Factor A3, Incentives: Reward

- The provision of factor A3 while performing task 1

Question 1.6 in the survey (Appendix C) asked participants how often the organizations they work with/for provide them with adequate incentives contingent upon performing task 1 (e.g. financial, recognition, and encouragement). The result shown in table 21 and figure 10 shows that 75% (N= 96) of participants reported that organizations either sometimes, rarely, or never provide them with adequate incentives contingent upon performing task 1 for better conduct of this task while only 25% reported that this factor was always or most of the time provided by organizations. This result shows that the provision of this factor by organizations was not adequately prevalent.

Table 21

The provision of factor A3 while performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	7	7.3%	7.3%		
	2	17	17.7%	17.7%		
	3	31	32.3%	32.3%	3.28	1.167
	4	24	25.0%	25.0%		
	5	17	17.7%	17.7%		
	Total	96	100%	100%		

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never
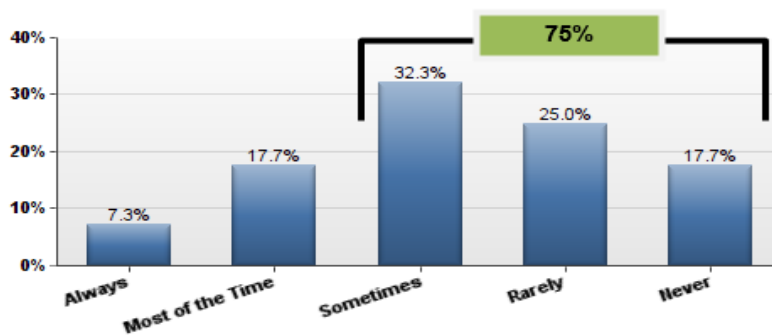
Figure 10: The provision of factor A3 while performing task 1

- The importance of factor A3 for performing task 1

Question 1.7 in the survey (Appendix C) asked participants about the importance of providing adequate incentives by the organization while performing task 1 (e.g. financial, recognition, and encouragement). The result shown in table 22 and figure 11 shows that 58.3% (N= 96) of participants considered this factor as either very important or important for better conduct of this task. This result shows that the provision of this factor could positively impact the conduct of task 1.

Table 22

The importance of factor A3 for performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	15	15.6%	15.6%		
	2	41	42.7%	42.7%		
	3	12	12.5%	12.5%	2.58	1.130
	4	25	26.0%	26.0%		
	5	3	3.1%	3.1%		
	Total	96	100%	100%		

Note. 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant, 5= Very Unimportant
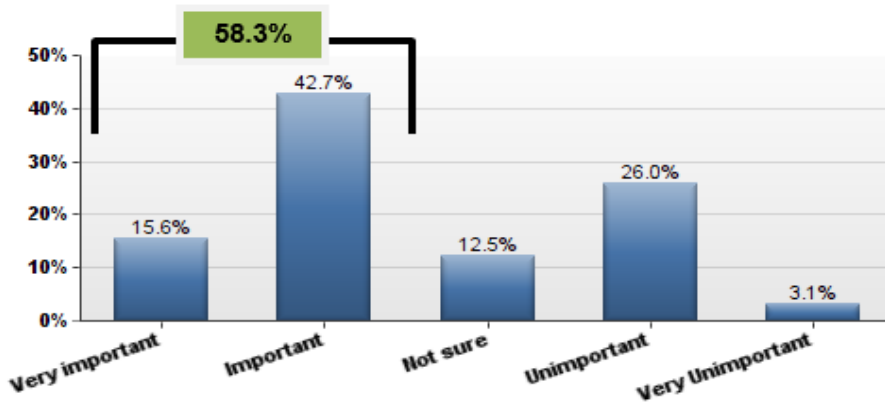
Figure 11: The importance of factor A3 for performing task 1

B- The individual repertory factors:

Factor B1, Knowledge: Knowing how to perform:

- The possession of factor B1 while performing task 1

Question 1.8 in the survey (Appendix C) asked participants about the possession of enough knowledge and appropriate skills that allow them to perform task 1 as it should be. The result shown in table 23 and figure 12 shows 95.8% (N= 96) of participants strongly agreed or agree that they possess enough knowledge and appropriate skills to perform task 1 as it should be. This result shows that the possession of this factor was adequately prevalent.

Table 23

The possession of factor B1 while performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	58	60.4%	60.4%		
	2	34	35.4%	35.4%		
	3	2	2.1%	2.1%	1.46	.648
	4	2	2.1%	2.1%		
	Total	96	100%	100.%		

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure, 4= Disagree
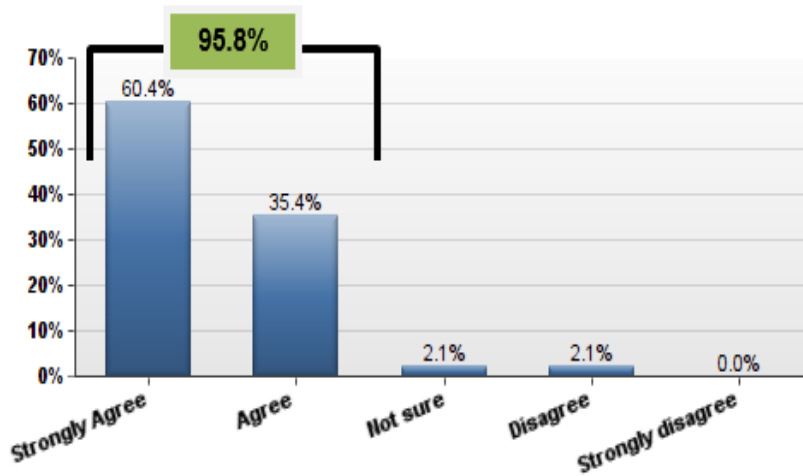
Figure 12: The possession of factor B1 while performing task 1

- The importance of factor B1 for performing task 1

Question 1.9 in the survey (Appendix C) asked participants if task 1 could be accomplished successfully without an HPI practitioner personally having knowledge and skills. The result shown in table 24 and figure 13 shows that 76.1% (N= 96) of participants either disagree or strongly disagree on getting this task successfully accomplished without an HPI practitioner possessing adequate knowledge and skills personally. This result shows the importance of personally possessing this factor for performing this task as it should be, so the possession of this factor could positively impact the conduct of task 1.

Table 24

The importance of factor B1 for performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	5	5.2%	5.2%		
	2	6	6.3%	6.3%		
	3	12	12.5%	12.5%	3.83	1.033
	4	50	52.1%	52.1%		
	5	23	24.0%	24.0%		
	Total	96	100%	100%		

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure, 4= Disagree, 5= Strongly Disagree
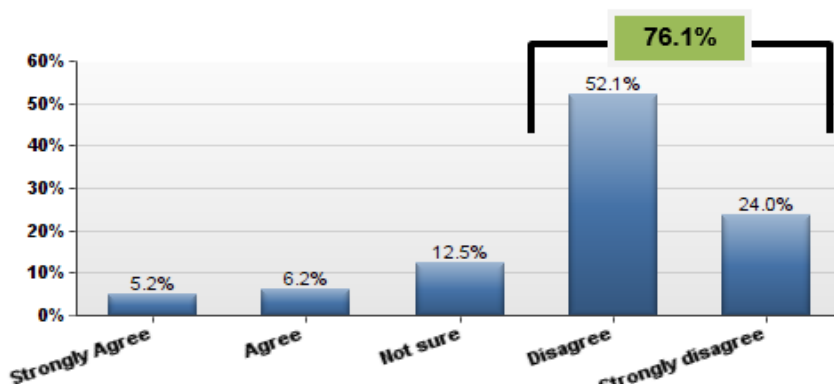
Figure 13: The importance of factor B1 for performing task1

Factor B2, Capacity: Physical and intellectual ability

In this particular factor, it was taken for granted that the possession of physical and intellectual ability to perform task 1 is mandatory, and performers must be physically and intellectually capable to perform this task; therefore, the participants were not asked about the possession and importance of factor B2; instead they were asked to provide information regarding their satisfaction about their capabilities in performing task 1. So question 1.10 in the survey (Appendix C) asked participants about their capability of performing task 1. The result shown in table 25 and figure 14 shows that 97.9% (N= 96) of participants either strongly agree or agree that they feel capable of performing this task. This result shows that the possession of this factor among HPI practitioners was adequately prevalent and could positively impact the conduct of task 1.

Table 25

Practitioners' attitude toward the possession of factor B2 to perform task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	62	64.6%	64.6%		
	2	32	33.3%	33.3%		
	3	1	1.0%	1.0%	1.39	.569
	4	1	1.0%	1.0%		
	Total	96	100%	100%		

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure, 4= Disagree
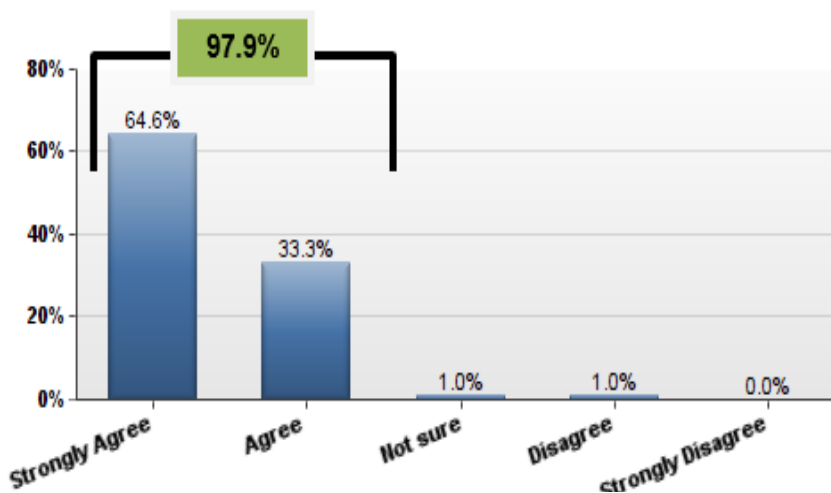
Figure 14: Practitioners' attitude toward the possession of factor B2 to perform task 1

Factor B3, Motives: Willingness to work

- The possession of factor B3 while performing task 1

Question 1.11 in the survey (Appendix C) investigated the possession of motives/willingness to perform task 1. The result shown in table 26 and figure 15 shows 93.7% (N= 96) of participants either strongly agreed or agree that they were motivated to perform this task. This result shows that the possession of this factor among HPI practitioners was adequately prevalent and could positively impact the conduct of task 1.

Table 26

The possession of factor B3 while performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	53	55.2%	55.2%		
	2	37	38.5%	38.5%	1.51	.615
	3	6	6.3%	6.3%		
	Total	96	100%	100%		

*Note. 1= Strongly Agree, 2= Agree, 3= Not Sure*

Figure 15: The possession of factor B3 while performing task 1

- The importance of factor B3 for performing task 1

Question 1.12 in the survey (Appendix C) asked participants about the importance of being motivated to perform task 1. The result shown in table 27 and figure 16 shows that 95.8% (N= 96) of participants considered this factor as either very important or important for better conduct of this task. This result shows the importance of possessing this factor, and it could positively impact the conduct of task 1.

Table 27

The importance of factor B3 for performing task 1

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	46	47.9%	47.9%	1.56	.577
	2	46	47.9%	47.9%		
	3	4	4.2%	4.2%		
	Total	96	100%	100%		

Note. 1= Very Important, 2= Important, 3= Not Sure
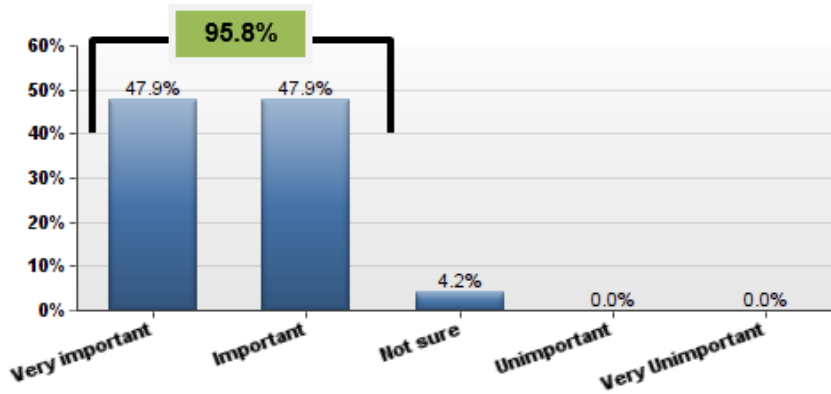
Figure 16: The importance of factor B3 for performing task 1

Task two:

The factors that impact the use of task two as they are perceived by HPI practitioners were as

follow:

A- The environmental supports factors:

Factor A1, Data: Information:

- The provision of factor A1 while performing task 2

Question 2.2 in the survey (Appendix C) asked participants how often the organizations

they work with/for provide them with information about their performance while performing task

2, (e.g. feedback about what they are doing and description of what performance is expected of

them). The result shown in table 28 and figure 17 shows that 68.6% (N= 86) of participants

reported that organizations either sometimes, rarely, or never provide them with the information

needed for better conduct of this task while only 31.4% reported that this factor was always or

most of the time provided by organizations. This result shows that the provision of this factor by

organizations was not adequately prevalent.

Table 28

The provision of factor A1 while performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	6	6.3%	7.0%		
	2	21	21.9%	24.4%		
	3	27	28.1%	31.4%	3.10	1.117
	4	22	22.9%	25.6%		
	5	10	10.4%	11.6%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

*Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never*
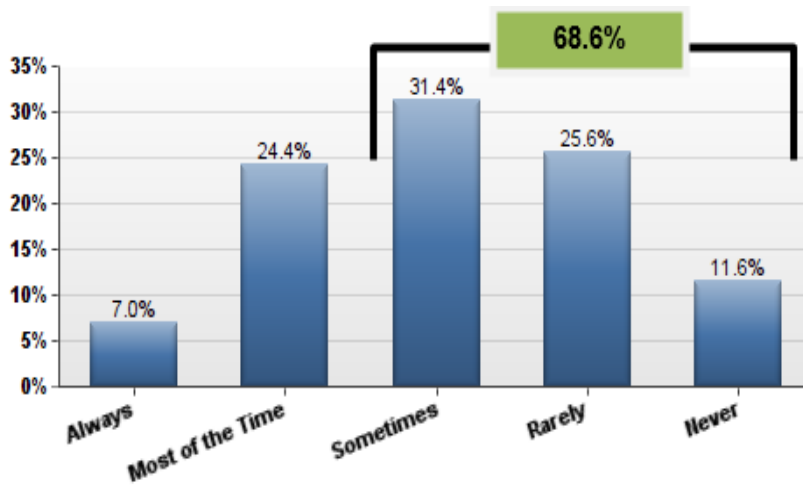
Figure 17: The provision of factor A1 while performing task 2

- The importance of factor A1 for performing task 2

Question 2.3 in the survey (Appendix C) asked participants about the importance of

providing information by the organization while performing task 2. The result shown in table 29

and figure 18 shows that 56.9% (N= 86) of participants considered this factor as either very

important or important for better conduct of this task. This result shows that the provision of this factor could positively impact the conduct of task 2.

Table 29

The importance of factor A1 for performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	23	24.0%	26.7%		
	2	32	33.3%	37.2%		
	3	11	11.5%	12.8%	2.36	1.177
	4	17	17.7%	19.8%		
	5	3	3.1%	3.5%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

Note. 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant, 5= Very Unimportant
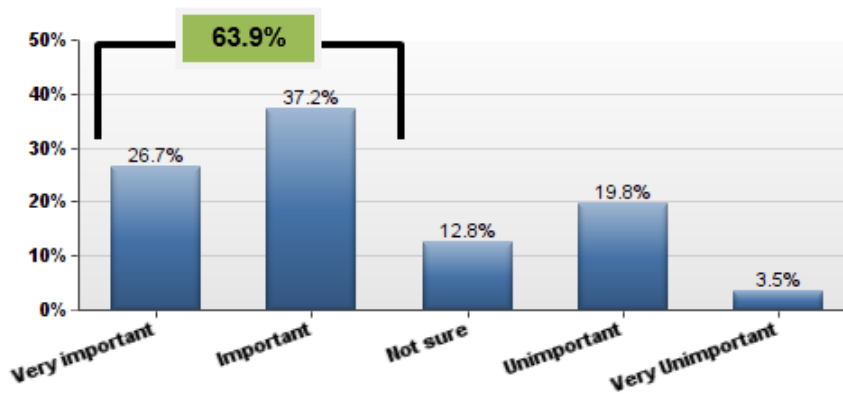
Figure 18: The importance of factor A1 for performing task 2

Factor A2, Instruments: Resources

- The provision of factor A2 while performing task 2

Question 2.4 in the survey (Appendix C) asked participants how often the organizations they work with/for provide them with the resources needed for performing task 2 (e.g. time, additional staff, clear procedures). The result shown in table 30 and figure 19 shows that 56.9% (N= 86) of participants reported that organizations provide this factor either always or most of the

time, and 30.2% reported that organizations sometimes provide them with the resources needed

for better conduct of this task. This result shows that the provision of this factor by organizations

does exist but is not very prevalent.

Table 30

The provision of factor A2 while performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	10	10.4%	11.6%		
	2	39	40.6%	45.3%		
	3	26	27.1%	30.2%	2.47	.916
	4	9	9.4%	10.5%		
	5	2	2.1%	2.3%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never
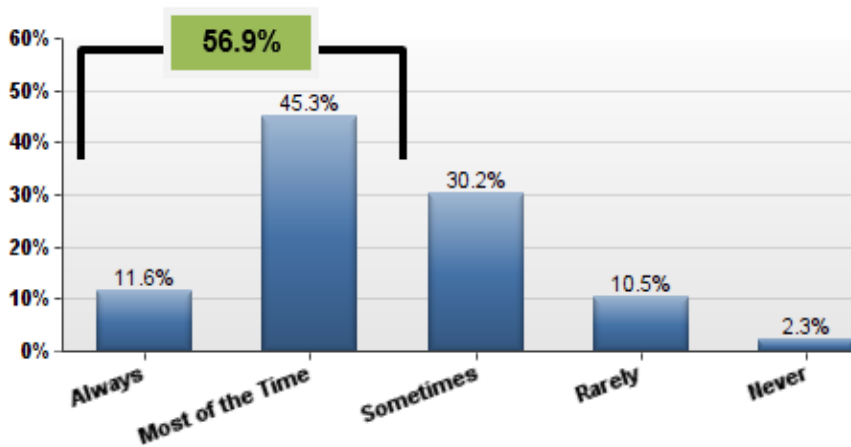
Figure 19: The provision of factor A2 while performing task 2

- The importance of factor A2 for performing task 2

Question 2.5 in the survey (Appendix C) asked participants about the importance of

providing the resources by the organization for performing task 2 (e.g. time, additional staff, clear

procedures). The result shown in table 31 and figure 20 shows that 93% (N= 86) of participants

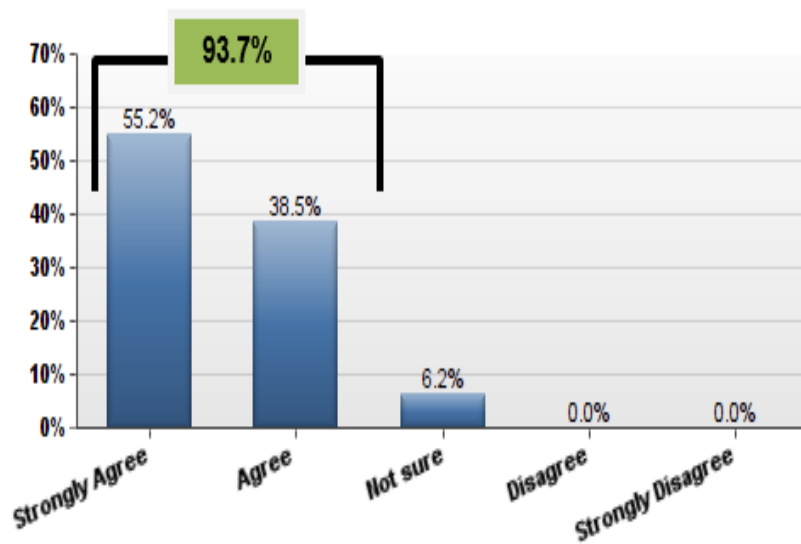considered this factor as either very important or important for better conduct of this task. This result shows that the provision of this factor could positively impact the conduct of task 2.

Table 31

The importance of factor A2 for performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	43	44.8%	50.0%		
	2	37	38.5%	43.0%		
	3	5	5.2%	5.8%	1.58	.659
	4	1	1.0%	1.2%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

Note. 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant

Figure 20: The importance of factor A2 for performing task 2

Factor A3, Incentives: Reward

- The provision of factor A3 while performing task 2

Question 2.6 in the survey (Appendix C) asked participants how often the organizations they work with/for provide them with adequate incentives contingent upon performing task 2 (e.g. financial, recognition, and encouragement). The result shown in table 32 and figure 21 shows that 75.2% (N= 86) of participants reported that organizations either sometimes, rarely, or never

provide them with adequate incentives contingent upon performing task 2 for better conduct of this task while only 24.8% reported that this factor was always or most of the time provided by organizations. This result shows that the provision of this factor by organizations was not adequately prevalent.

Table 32

The provision of factor A3 while performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	4	4.2%	4.7%		
	2	19	19.8%	22.1%		
	3	26	27.1%	30.2%	3.29	1.136
	4	22	22.9%	25.6%		
	5	15	15.6%	17.4%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never
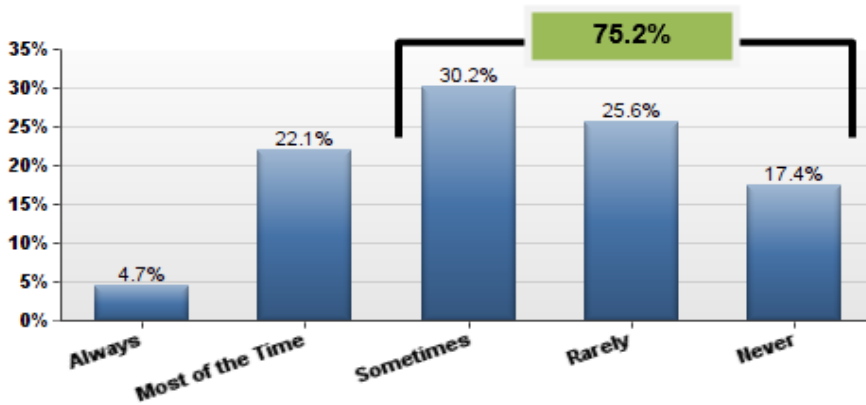
Figure 21: The provision of factor A3 while performing task 2

- The importance of factor A3 for performing task 2

Question 2.7 in the survey (Appendix C) asked participants the importance of providing adequate incentives by the organization while performing task 2 (e.g. financial, recognition, and encouragement). The result shown in table 33 and figure 22 shows that 51.2% (N= 86) of participants considered this factor as either very important or important for better conduct of this

task. This result shows that the provision of this factor could positively impact the conduct of task 2.

Table 33

The importance of factor A3 for performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	11	11.5%	12.8%		
	2	33	34.4%	38.4%		
	3	19	19.8%	22.1%	2.65	1.060
	4	21	21.9%	24.4%		
	5	2	2.1%	2.3%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

Note. 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant, 5= Very Unimportant
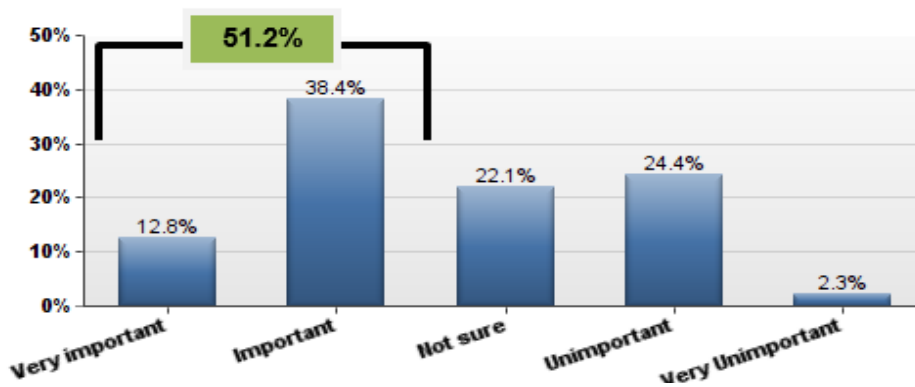
Figure 22: The importance of factor A3 for performing task 2

B- The individual repertory factors:

Factor B1, Knowledge: Knowing how to perform:

- The possession of factor B1 while performing task 2

Question 2.8 in the survey (Appendix C) asked participants about the possession of enough knowledge and appropriate skills that allow them to perform task 2 as it should be. The result

shown in table 34 and figure 23 shows 98.9% (N= 86) of participants strongly agreed or agree that they possess enough knowledge and appropriate skills to perform task 2 as it should be. This result shows that the possession of this factor was adequately prevalent.

Table 34

The possession of factor B1 while performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	57	59.4%	66.3%		
	2	28	29.2%	32.6%	1.37	.614
	5	1	1.0%	1.2%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

*Note. 1= Strongly Agree, 2= Agree, 5= Strongly Disagree*

Figure 23: The possession of factor B1 while performing task 2

- The importance of factor B1 for performing task 2

Question 2.9 in the survey (Appendix C) asked participants if task 2 could be accomplished successfully without an HPI practitioner having personally knowledge and skills. The result shown in table 35 and figure 24 shows that 84.9% (N= 86) of participants either disagree or strongly

disagree on getting this task successfully accomplished without an HPI practitioner personally possessing adequate knowledge and skills. This result shows the importance of personally possessing this factor for performing this task as it should be, so the possession of this factor could positively impact the conduct of task 2.

Table 35

The importance of factor B1 for performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	4	4.2%	4.7%		
	2	9	9.4%	10.5%		
	3	9	9.4%	10.5%	3.84	1.105
	4	39	40.6%	45.3%		
	5	25	26.0%	29.1%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure, 4= Disagree, 5= Strongly Disagree
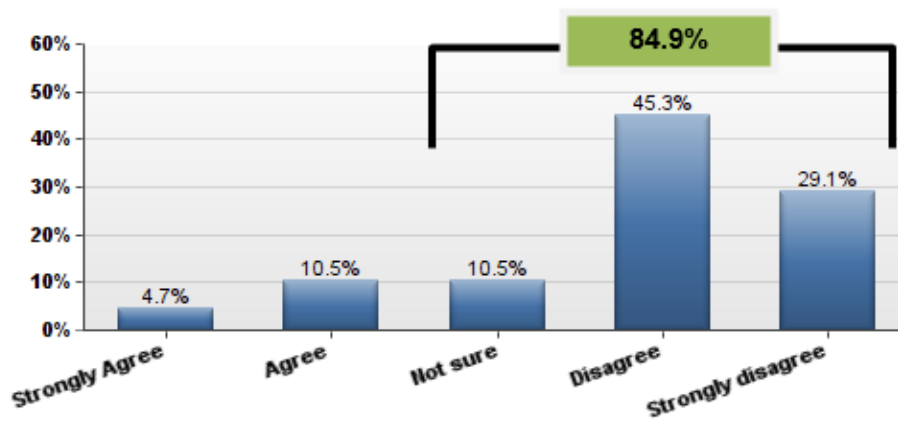
Figure 24: The importance of factor B1 for performing task 2

Factor B2, Capacity: Physical and intellectual ability

In this particular factor, it was taken for granted that the possession of physical and intellectual ability to perform task 2 is mandatory, and performers must be physically and intellectually capable to perform this task; therefore, the participants were not asked about the

possession and importance of factor B2; instead they were asked to provide information regarding their satisfaction about their capabilities in performing task 2. So question 2.10 in the survey (Appendix C) asked participants about their capability of performing task 2. The result shown in table 36 and figure 25 shows that 98.8% (N= 86) of participants either strongly agree or agree that they feel capable of performing this task. This result shows that the possession of this factor among HPI practitioners was adequately prevalent and could positively impact the conduct of task 2.

Table 36

Practitioners' attitude toward the possession of factor B2 to perform task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	59	61.5%	68.6%		
	2	26	27.1%	30.2%	1.35	.609
	5	1	1.0%	1.2%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

Note. 1= Strongly Agree, 2= Agree, 5= Strongly Disagree
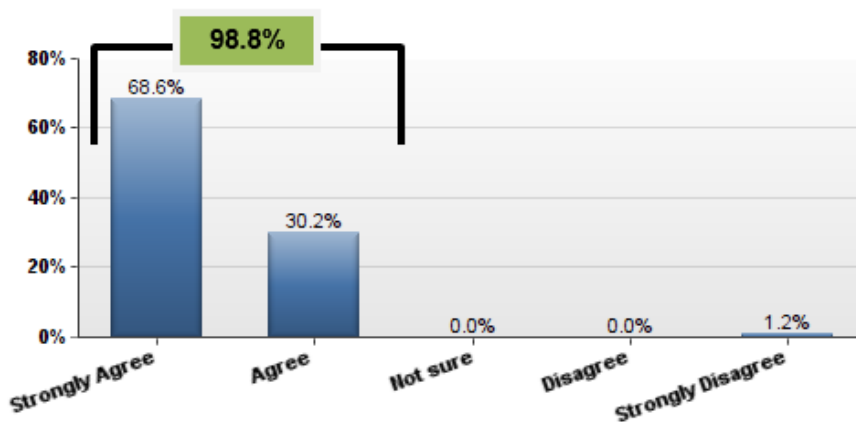
Figure 25: Practitioners' attitude toward the possession of factor B2 to perform task 2

Factor B3, Motives: Willingness to work

- The possession of factor B3 while performing task 2

Question 2.11 in the survey (Appendix C) investigated the possession of motives/willingness to perform task 2. The result shown in table 37 and figure 26 shows 96.5%

(N= 86) of participants either strongly agreed or agree that they were motivated to perform this task. This result shows that the possession of this factor among HPI practitioners was adequately prevalent and could positively impact the conduct of task 2.

Table 37

The possession of factor B3 while performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	56	58.3%	65.1%		
	2	27	28.1%	31.4%	1.38	.557
	3	3	3.1%	3.5%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

*Note. 1= Strongly Agree, 2= Agree, 3= Not Sure*

Figure 26: The possession of factor B3 while performing task 2

- The importance of factor B3 for performing task 2

Question 2.12 in the survey (Appendix C) asked participants about the importance of being motivated to perform task 2. The result shown in table 38 and figure 27 shows that 97.7% (N= 86) of participants considered this factor as either very important or important for better conduct of this task. This result shows the importance of possessing this factor, and it could positively impact the conduct of task 2.

Table 38

The importance of factor B3 for performing task 2

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	38	39.6%	44.2%		
	2	46	47.9%	53.5%	1.58	.542
	3	2	2.1%	2.3%		
	Total	86	89.6%	100%		
Missing		10	10.4%			
Total		96	100%			

Note. 1= Very Important, 2= Important, 3= Not Sure
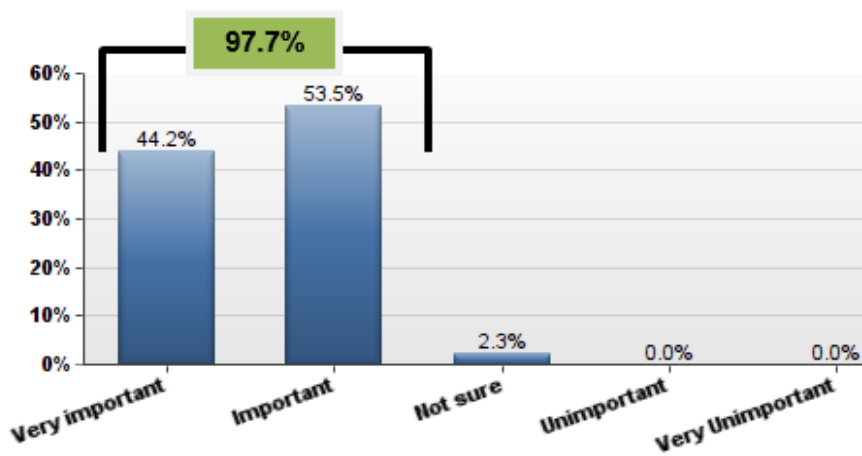
Figure 27: The importance of factor B3 for performing task 2

Task three

The factors that impact the use of task three as they are perceived by HPI practitioners were as

follow:

A- The environmental supports factors:

Factor A1, Data: Information:

- The provision of factor A1 while performing task 3

Question 3.2 in the survey (Appendix C) asked participants how often the organizations

they work with/for provide them with information about their performance while performing task

3, (e.g. feedback about what they are doing and description of what performance is expected of

them). The result shown in table 39 and figure 28 shows that 66.6% (N= 81) of participants reported that organizations either sometimes, rarely, or never provide them with the information needed for better conduct of this task while only 33.4% reported that this factor was always or most of the time provided by organizations. This result shows that the provision of this factor by organizations was not adequately prevalent.

Table 39

The provision of factor A1 while performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	10	10.4%	12.3%		
	2	17	17.7%	21.0%		
	3	24	25.0%	29.6%	3.04	1.209
	4	20	20.8%	24.7%		
	5	10	10.4%	12.3%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never
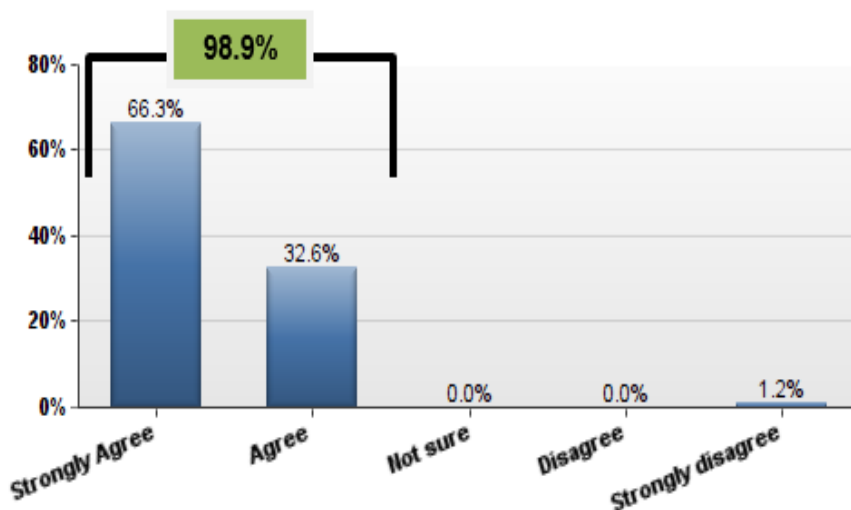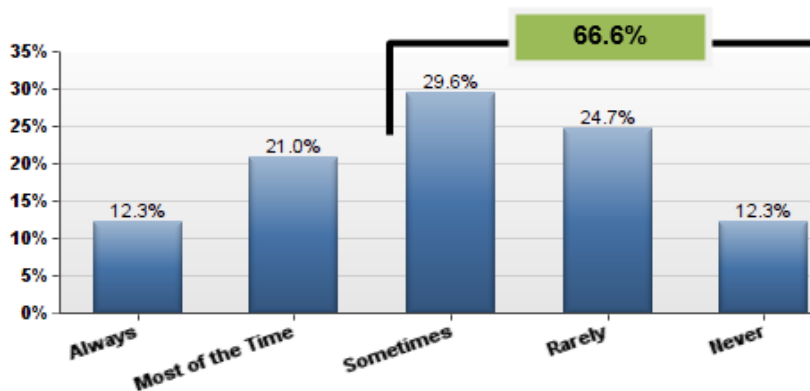

Figure 28: The provision of factor A1 while performing task 3

- The importance of factor A1 for performing task 3

Question 3.3 in the survey (Appendix C) asked participants about the importance of providing information by the organization while performing task 3. The result shown in table 40 and figure 29 shows that 71.6% (N= 81) of participants considered this factor as either very

important or important for better conduct of this task. This result shows that the provision of this factor could positively impact the conduct of task 3.

Table 40

The importance of factor A1 for performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	24	25.0%	29.6%		
	2	34	35.4%	42.0%		
	3	6	6.3%	7.4%	2.21	1.115
	4	16	16.7%	19.8%		
	5	1	1.0%	1.2%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant, 5= Very Unimportant
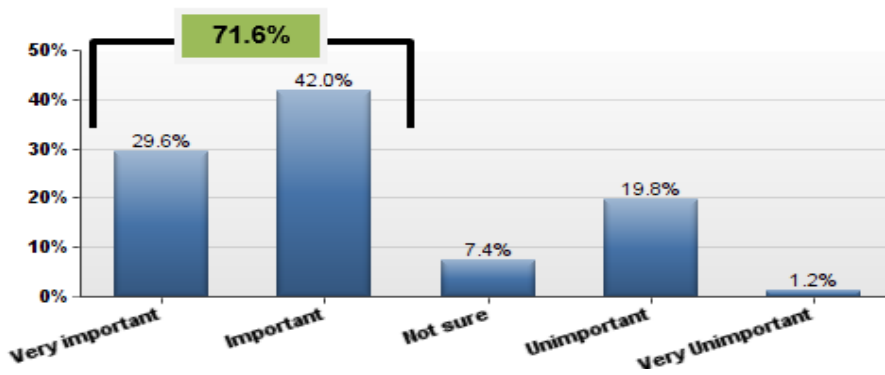
Figure 29: The importance of factor A1 for performing task 3

Factor A2, Instruments: Resources

- The provision of factor A2 while performing task 3

Question 3.4 in the survey (Appendix C) asked participants about how often the organizations they work with/for provide them with the resources needed for performing task 3 (e.g. time, additional staff, clear procedures). The result shown in table 41 and figure 30 shows that 54.3% (N= 81) of participants reported that organizations provide this factor either always or most of the time, and 29.6% reported that organizations sometimes provide them with the

resources needed for better conduct of this task. This result shows that the provision of this factor

by organizations does exist but not very prevalent.

Table 41

The provision of factor A2 while performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	8	8.3%	9.9%		
	2	36	37.5%	44.4%		
	3	24	25.0%	29.6%	2.54	.936
	4	11	11.5%	13.6%		
	5	2	2.1%	2.5%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never
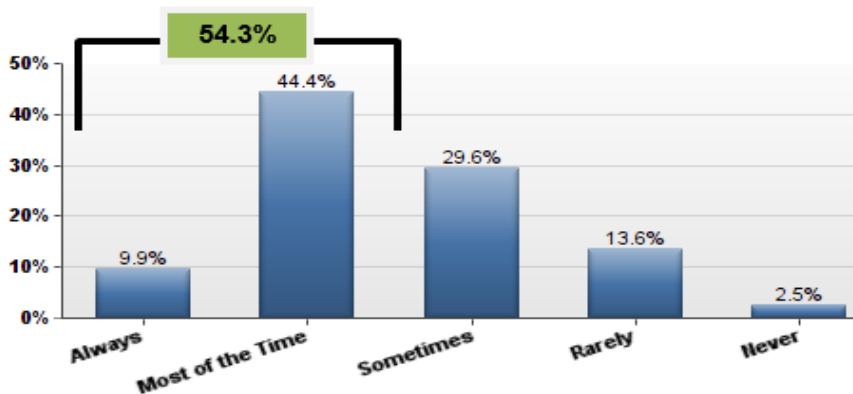
Figure 30: The provision of factor A2 while performing task 3

- The importance of factor A2 for performing task 3

Question 3.5 in the survey (Appendix C) asked participants about the importance of

providing the resources by the organization for performing task 3 (e.g. time, additional staff, clear

procedures). The result shown in table 42 and figure 31 shows that 93.8% (N= 81) of participants

considered this factor as either very important or important for better conduct of this task. This

result shows that the provision of this factor could positively impact the conduct of task 3.

Table 42

The importance of factor A2 for performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	36	37.5	44.4		
	2	40	41.7	49.4	1.62	.603
	3	5	5.2	6.2		
	Total	81	84.4	100.0		
Missing		15	15.6			
Total		96	100.0			

Note. 1= Very Important, 2= Important, 3= Not Sure
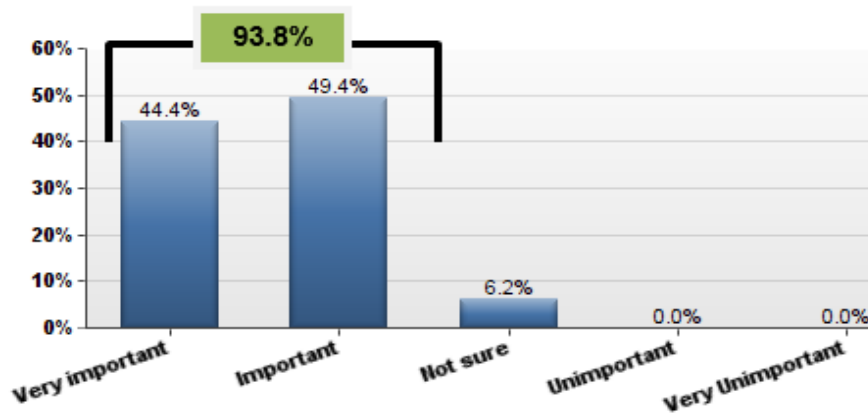
Figure 31: The importance of factor A2 for performing task 3

Factor A3, Incentives: Reward

- The provision of factor A3 while performing task 3

Question 3.6 in the survey (Appendix C) asked participants how often the organizations they work with/for provide them with adequate incentives contingent upon performing task 3 (e.g. financial, recognition, and encouragement). The result shown in table 43 and figure 32 shows that 69.2% (N= 81) of participants reported that organizations either sometimes, rarely, or never provide them with adequate incentives contingent upon performing task 3 for better conduct of this task while only 30.8% reported that this factor was always or most of the time provided by organizations. This result shows that the provision of this factor by organizations was not adequately prevalent.

Table 43

The provision of factor A3 while performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	6	6.3%	7.4%		
	2	19	19.8%	23.5%		
	3	25	26.0%	30.9%	3.14	1.148
	4	20	20.8%	24.7%		
	5	11	11.5%	13.6%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never
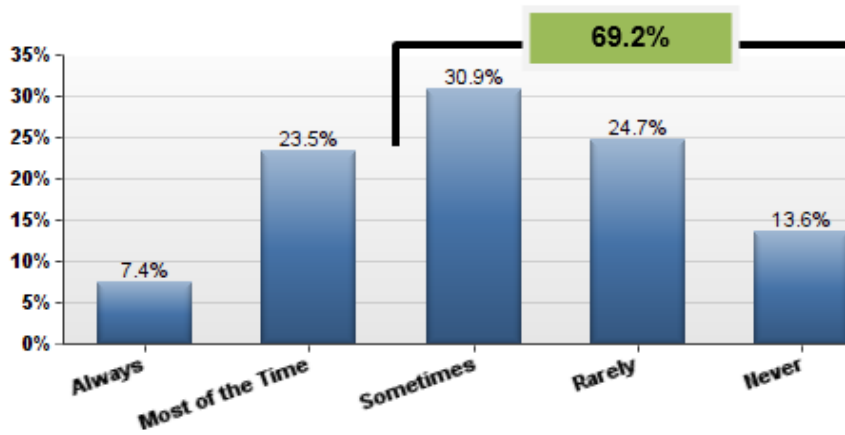
Figure 32: The provision of factor A3 while performing task 3

- The importance of factor A3 for performing task 3

Question 3.7 in the survey (Appendix C) asked participants about the importance of providing adequate incentives by the organization while performing task 3 (e.g. financial, recognition, and encouragement). The result shown in table 44 and figure 33 shows that 55.5% (N= 81) of participants considered this factor as either very important or important for better conduct of this task. This result shows that the provision of this factor could positively impact the conduct of task 3.

Table 44

The importance of factor A3 for performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	10	10.4%	12.3%		
	2	35	36.5%	43.2%		
	3	13	13.5%	16.0%	2.63	1.078
	4	21	21.9%	25.9%		
	5	2	2.1%	2.5%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

NOTE: 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant, 5= Very Unimportant
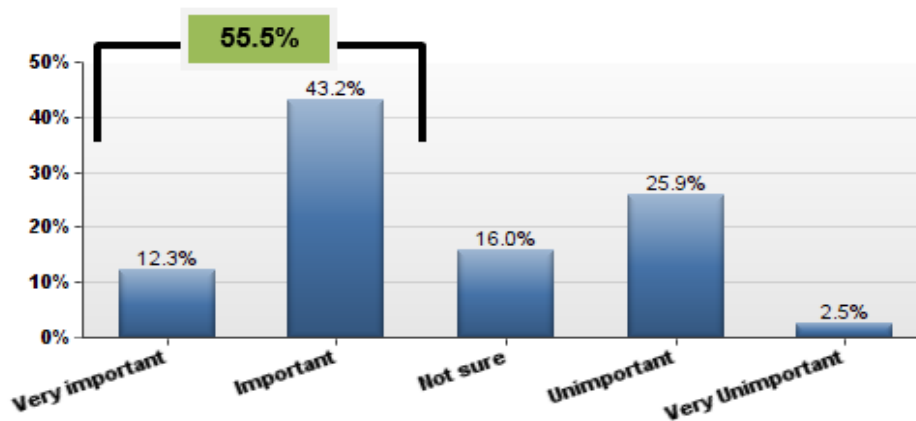
Figure 33: The importance of factor A3 for performing task 3

B- The individual repertory factors:

Factor B1, Knowledge: Knowing how to perform:

- The possession of factor B1 while performing task 3

Question 3.8 in the survey (Appendix C) asked participants about the possession of enough knowledge and appropriate skills that allow them to perform task 3 as it should be. The result shown in table 45 and figure 34 shows 93.3% (N= 81) of participants strongly agreed or agree that they possess enough knowledge and appropriate skills to perform task 3 as it should be. This result shows that the possession of this factor was adequately prevalent.

Table 45

The possession of factor B1 while performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	53	55.2%	65.4%		
	2	25	26.0%	30.9%		
	3	2	2.1%	2.5%	1.41	.667
	5	1	1.0%	1.2%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure 5= Strongly Disagree

Figure 34: The possession of factor B1 while performing task 3

- The importance of factor B1 for performing task 3

Question 3.9 in the survey (Appendix C) asked participants if task 3 could be accomplished successfully without an HPI practitioner personally having the knowledge and skills. The result shown in table 46 and figure 35 shows that 85.1% (N= 81) of participants either disagree or strongly disagree on getting this task successfully accomplished without an HPI practitioner personally possessing adequate knowledge and skills. This result shows the importance of personally possessing this factor for performing this task as it should be, so the possession of this factor could positively impact the conduct of task 3.

Table 46

The importance of factor B1 for performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	5	5.2%	6.2%		
	2	7	7.3%	8.6%		
	3	9	9.4%	11.1%	3.79	1.115
	4	39	40.6%	48.1%		
	5	21	21.9%	25.9%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure, 4= Disagree, 5= Strongly Disagree
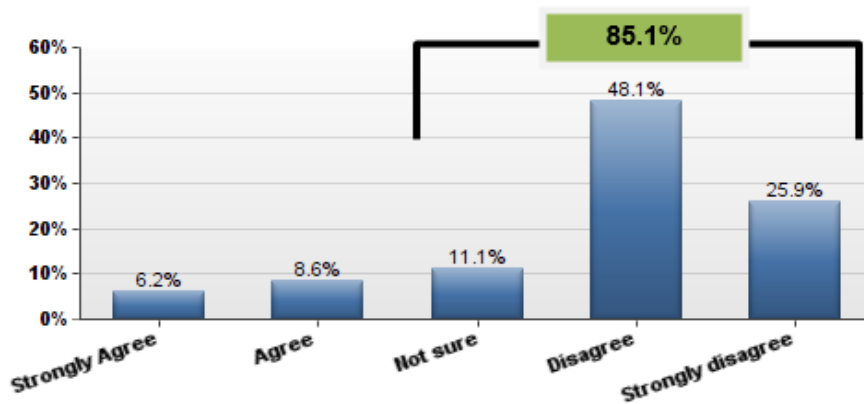
Figure 35: The importance of factor B1 for performing task 3

Factor B2, Capacity: Physical and intellectual ability

In this particular factor, it was taken for granted that the possession of physical and intellectual ability to perform task 3 is mandatory, and performers must be physically and intellectually capable to perform this task; therefore, the participants were not asked about the possession and the importance of factor B2; instead they were asked to provide information regarding their satisfaction about their capabilities in performing task 3. So question 3.10 in the survey (Appendix C) asked participants about their capability of performing task 3. The result shown in table 47 and figure 36 shows that 97.5% (N= 81) of participants either strongly agree or

agree that they feel capable of performing this task. This result shows that the possession of this factor among HPI practitioners was adequately prevalent and could positively impact the conduct of task 3.

Table 47

Practitioners' attitude toward the possession of factor B2 to perform task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	56	58.3%	69.1%		
	2	23	24.0%	28.4%		
	3	1	1.0%	1.2%	1.36	.639
	5	1	1.0%	1.2%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure, 5= Strongly Disagree

Figure 36: Practitioners' attitude toward the possession of factor B2 to perform task 3

Factor B3, Motives: Willingness to work

- The possession of factor B3 while performing task 3

Question 3.11 in the survey (Appendix C) investigated the possession of motives/willingness to perform task 3. The result shown in table 48 and figure 37 shows 96.3% (N= 81) of participants either strongly agreed or agree that they were motivated to perform this task. This result shows that the possession of this factor among HPI practitioners was adequately prevalent and could positively impact the conduct of task 3.

Table 48

The possession of factor B3 while performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	44	45.8%	54.3%		
	2	34	35.4%	42.0%	1.49	.573
	3	3	3.1%	3.7%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure
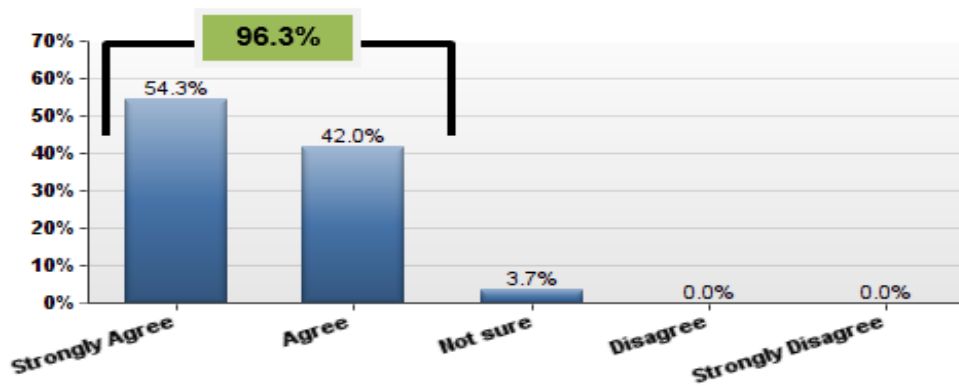
Figure 37: The possession of factor B3 while performing task 3

- The importance of factor B3 for performing task 3

Question 3.12 in the survey (Appendix C) asked participants about the importance of being motivated to perform task 3. The result shown in table 49 and figure 38 shows that 98.8% (N= 81) of participants considered this factor as either very important or important for better conduct of this task. This result shows the importance of possessing this factor, and it could positively impact the conduct of task 3.

Table 49

The importance of factor B3 for performing task 3

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	35	36.5%	43.2%		
	2	45	46.9%	55.6%	1.58	.521
	3	1	1.0%	1.2%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Very Important, 2= Important, 3= Not Sure
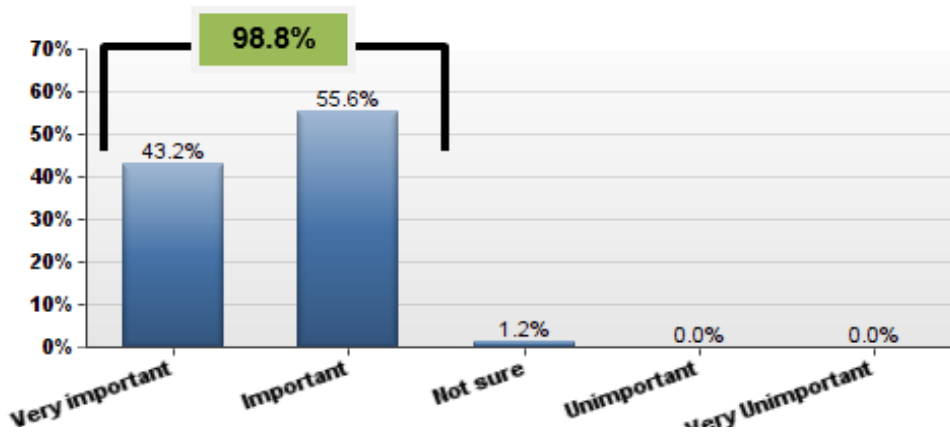
Figure 38: The importance of factor B3 for performing task 3

Task four

The factors that impact the use of task four as they are perceived by HPI practitioners were as

follow:

A- The environmental supports factors:

Factor A1, Data: Information:

- The provision of factor A1 while performing task 4

Question 4.2 in the survey (Appendix C) asked participants how often the organizations

they work with/for provide them with information about their performance while performing task

4, (e.g. feedback about what they are doing and description of what performance is expected of

them). The result shown in table 50 and figure 39 shows that 69.2% (N= 81) of participants

reported that organizations either sometimes, rarely, or never provide them with the information needed for better conduct of this task while only 30.8% reported that this factor was always or most of the time provided by organizations. This result shows that the provision of this factor by organizations was not adequately prevalent.

Table 50

The provision of factor A1 while performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	10	10.4%	12.3%		
	2	15	15.6%	18.5%		
	3	25	26.0%	30.9%	3.05	1.172
	4	23	24.0%	28.4%		
	5	8	8.3%	9.9%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never

Figure 39: The provision of factor A1 while performing task 4

- The importance of factor A1 for performing task 4

Question 4.3 in the survey (Appendix C) asked participants about the importance of providing information by the organization while performing task 4. The result shown in table 51 and figure 40 shows that 67.9% (N= 81) of participants considered this factor as either very

important or important for better conduct of this task. This result shows that the provision of this factor could positively impact the conduct of task 4.

Table 51

The importance of factor A1 for performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	23	24.0%	28.4%		
	2	32	33.3%	39.5%		
	3	10	10.4%	12.3%	2.26	1.127
	4	14	14.6%	17.3%		
	5	2	2.1%	2.5%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant, 5= Very Unimportant
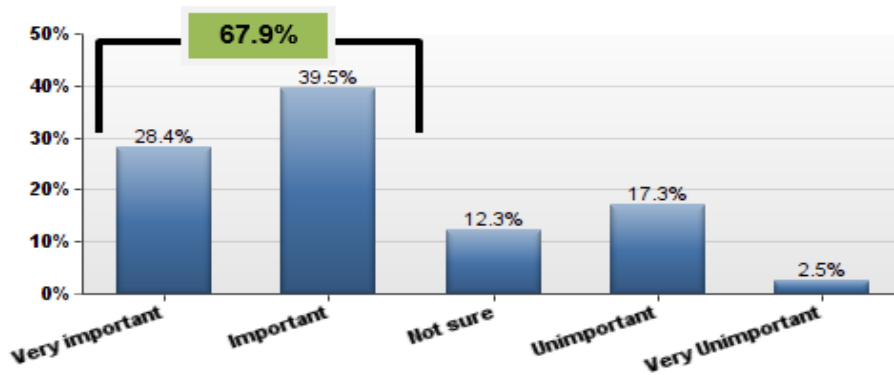
Figure 40: The importance of factor A1 for performing task 4

Factor A2, Instruments: Resources

• The provision of factor A2 while performing task 4

Question 4.4 in the survey (Appendix C) asked participants how often the organizations they work with/for provide them with the resources needed for performing task 4 (e.g. time, additional staff, clear procedures). The result shown in table 52 and figure 41 shows that 48.2% (N= 81) of participants reported that organizations provide this factor either always or most of the time, and 33.3% reported that organizations sometimes provide them with the resources needed

for better conduct of this task. This result shows that the provision of this factor by organizations does exist but is not very prevalent.

Table 52

The provision of factor A2 while performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	8	8.3%	9.9%		
	2	31	32.3%	38.3%		
	3	27	28.1%	33.3%	2.63	.955
	4	13	13.5%	16.0%		
	5	2	2.1%	2.5%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

*Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never*

Figure 41: The provision of factor A2 while performing task 4

- The importance of factor A2 for performing task 4

Question 4.5 in the survey (Appendix C) asked participants about the importance of providing the resources by the organization for performing task 4 (e.g. time, additional staff, clear procedures). The result shown in table 53 and figure 42 shows that 90.1% (N= 81) of participants considered this factor as either very important or important for better conduct of this task. This result shows that the provision of this factor could positively impact the conduct of task 4.

Table 53

The importance of factor A2 for performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	36	37.5%	44.4%		
	2	37	38.5%	45.7%		
	3	5	5.2%	6.2%	1.69	.752
	4	3	3.1%	3.7%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant, 5= Very Unimportant

Figure 42: The importance of factor A2 for performing task 4

Factor A3, Incentives: Reward

- The provision of factor A3 while performing task 4

Question 4.6 in the survey (Appendix C) asked participants about how often the organizations they work with/for provide them with adequate incentives contingent upon performing task 4 (e.g. financial, recognition, and encouragement). The result shown in table 54 and figure 43 shows that 74% (N= 81) of participants reported that organizations either sometimes, rarely, or never provide them with adequate incentives contingent upon performing task 4 for better conduct of this task while only 26% reported that this factor was always or most of the time

provided by organizations. This result shows that the provision of this factor by organizations was

not adequately prevalent.

Table 54

The provision of factor A3 while performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	6	6.3%	7.4%		
	2	15	15.6%	18.5%		
	3	24	25.0%	29.6%	3.23	1.121
	4	26	27.1%	32.1%		
	5	10	10.4%	12.3%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Always, 2= Most of the time, 3= Sometimes, 4= Rarely, 5= Never
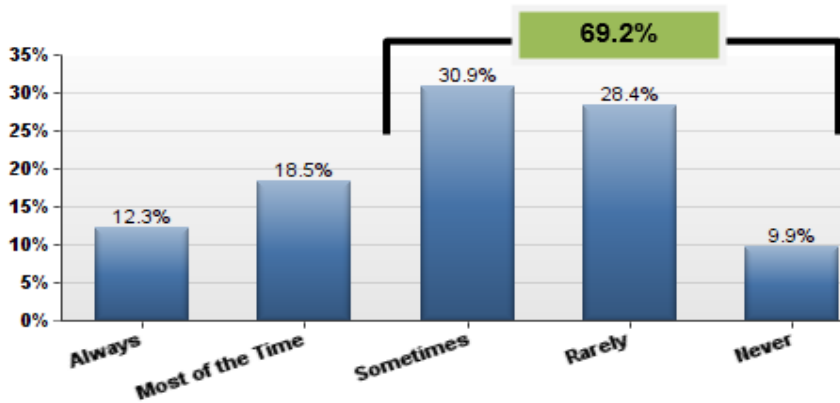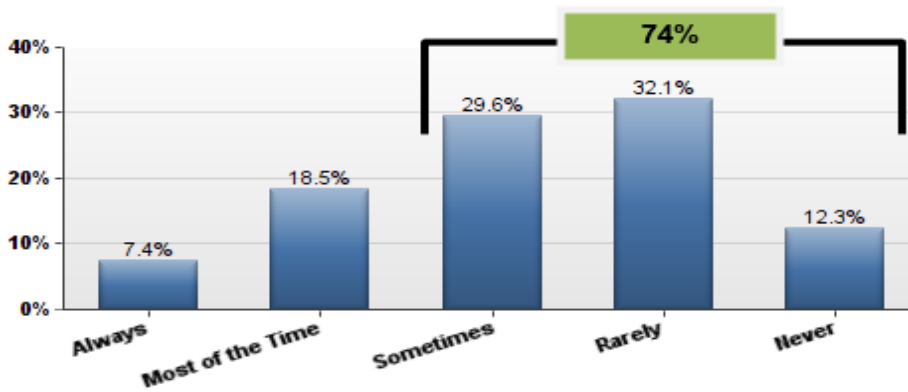

Figure 43: The provision of factor A3 while performing task 4

- The importance of factor A3 for performing task 4

Question 4.7 in the survey (Appendix C) asked participants about the importance of

providing adequate incentives by the organization while performing task 4 (e.g. financial,

recognition, and encouragement). The result shown in table 55 and figure 44 shows that 53% (N=

81) of participants considered this factor as either very important or important for better conduct

of this task. This result shows that the provision of this factor could positively impact the conduct

of task 4.

Table 55

The importance of factor A3 for performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	13	13.5%	16.0%		
	2	30	31.3%	37.0%		
	3	14	14.6%	17.3%	2.63	1.123
	4	22	22.9%	27.2%		
	5	2	2.1%	2.5%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Very Important, 2= Important, 3= Not Sure, 4= Unimportant, 5= Very Unimportant
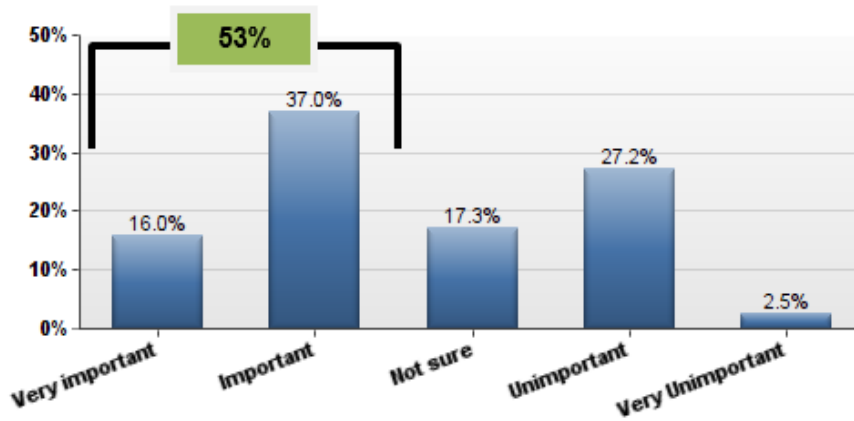
Figure 44: The importance of factor A3 for performing task 4

B- The individual repertory factors:

Factor B1, Knowledge: Knowing how to perform:

- The possession of factor B1 while performing task 4

Question 4.8 in the survey (Appendix C) asked participants about the possession of enough knowledge and appropriate skills that allow them to perform task 4 as it should be. The result shown in table 56 and figure 45 shows 95.1% (N= 81) of participants strongly agreed or agree that they possess enough knowledge and appropriate skills to perform task 4 as it should be. This result shows that the possession of this factor was adequately prevalent.

Table 56

The possession of factor B1 while performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	52	54.2%	64.2%		
	2	25	26.0%	30.9%		
	3	3	3.1%	3.7%	1.43	.688
	5	1	1.0%	1.2%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure, 5= Strongly Disagree
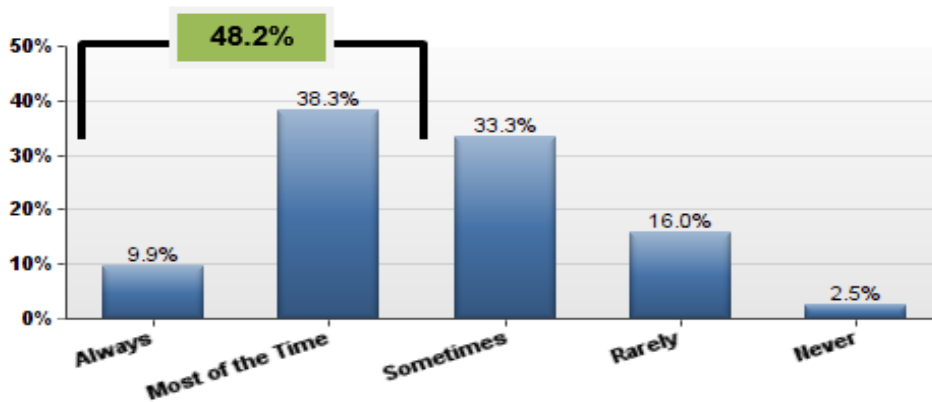

Figure 45: The possession of factor B1 while performing task 4

- The importance of factor B1 for performing task 4

Question 4.9 in the survey (Appendix C) asked participants if task 4 could be accomplished successfully without an HPI practitioner personally having the knowledge and skills. The result shown in table 57 and figure 46 shows that 82.7% (N= 81) of participants either disagree or strongly disagree on getting this task successfully accomplished without an HPI practitioner personally possessing adequate knowledge and skills personally. This result shows the importance of personally possessing this factor for performing this task as it should be, so the possession of this factor could positively impact the conduct of task 4.

Table 57

The importance of factor B1 for performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	7	7.3%	8.6%		
	2	7	7.3%	8.6%		
	3	8	8.3%	9.9%	3.75	1.210
	4	36	37.5%	44.4%		
	5	23	24.0%	28.4%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure, 4= Disagree, 5= Strongly Disagree
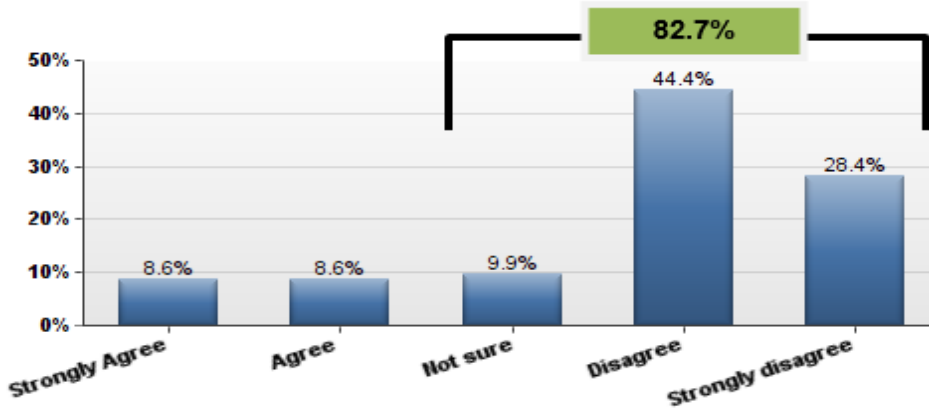
Figure 46: The importance of factor B1 for performing task 4

Factor B2, Capacity: Physical and intellectual ability

In this particular factor, it was taken for granted that the possession of physical and intellectual ability to perform task 4 is mandatory, and performers must be physically and intellectually capable to perform this task; therefore, the participants were not asked about the possession and the importance of factor B2; instead they were asked to provide information regarding their satisfaction about their capabilities in performing task 4. So question 4.10 in the survey (Appendix C) asked participants about their capability of performing task 4. The result shown in table 58 and figure 47 shows that 96.3% (N= 81) of participants either strongly agree or

agree that they feel capable of performing this task. This result shows that the possession of this factor among HPI practitioners was adequately prevalent and could positively impact the conduct of task 4.

Table 58

Practitioners' attitude toward the possession of factor B2 to perform task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	51	53.1%	63.0%		
	2	27	28.1%	33.3%		
	3	2	2.1%	2.5%	1.43	.670
	5	1	1.0%	1.2%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure, 5= Strongly Disagree

Figure 47: Practitioners' attitude toward the possession of factor B2 to perform task 4

Factor B3, Motives: Willingness to work

• The possession of factor B3 while performing task 4

Question 4.11 in the survey (Appendix C) investigated the possession of motives/willingness to perform task 4. The result shown in table 59 and figure 48 shows 98.1% (N= 81) of participants either strongly agreed or agree that they were motivated to perform this

task. This result shows that the possession of this factor among HPI practitioners was adequately prevalent and could positively impact the conduct of task 4.

Table 59

The possession of factor B3 while performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	46	47.9%	56.8%		
	2	31	32.3%	38.3%	1.48	.594
	3	4	4.2%	4.9%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Strongly Agree, 2= Agree, 3= Not Sure
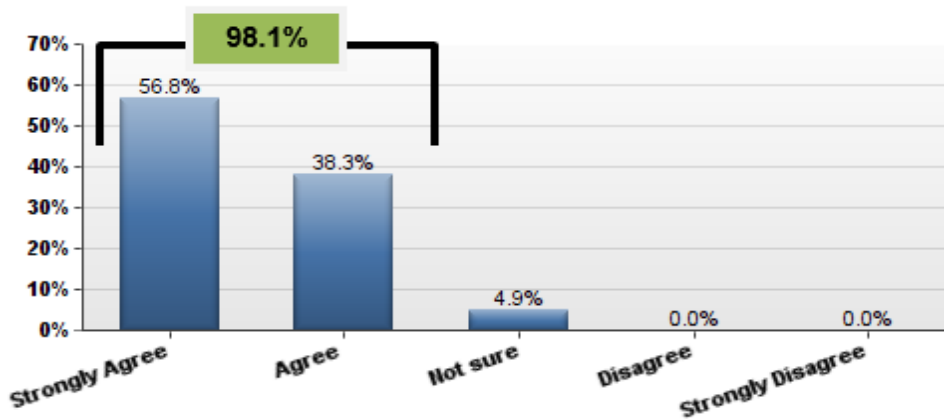
Figure 48: The possession of factor B3 while performing task 4

- The importance of factor B3 for performing task 4

Question 4.12 in the survey (Appendix C) asked participants about the importance of being motivated to perform task 4. The result shown in table 60 and figure 49 shows that 98.7% (N= 81) of participants considered this factor as either very important or important for better conduct of this task. This result shows the importance of possessing this factor, and it could positively impact the conduct of task 4.

Table 60

The importance of factor B3 for performing task 4

		Frequency	Percent	Valid Percent	Mean	Std. Deviation
Valid	1	36	37.5%	44.4%		
	2	44	45.8%	54.3%	1.57	.523
	3	1	1.0%	1.2%		
	Total	81	84.4%	100%		
Missing		15	15.6%			
Total		96	100%			

Note. 1= Very Important, 2= Important, 3= Not Sure

Figure 49: The importance of factor B3 for performing task 4

Results synthesis:

Table 61 below synthesizes the results associated with research question one that explored the prevalence of the four key tasks of NA. Also Table 62 synthesizes the results associated with the research question two that addressed six factors that impact the conduct of NA tasks. Each factor was addressed in terms of the provision/possession of each factor while performing each task and the importance of each factor to each task. Finally, table 63 presents the importance of each factor to all tasks and ranks them based on importance within each category and the overall importance to all tasks.

Table 61

The prevalence of key tasks of NA

NA Tasks	Percentage of performing a task by HPI practitioners always or most of the time	Rank (See the note below)
Task 1: Developing a plan for Needs Assessment	81.2%	4
Task 2: Collecting data about the desired performance (What should be) and the current performance (What is)	90.7%	1
Task 3: Determining the actual need or the gap in performance	86.4%	2
Task 4: Determining the cause(s) of the performance gap(s)	84%	3

Note: This ranking is a logical ranking that indicates only that one data point is ranked higher or lower than other points based on percentage as descriptive statistics and has nothing to do with inferential statistic. Because this study is not incorporating classical hypothesis testing, this type of statistics is not used in this study, and there is no need to conduct it. Additionally, this study is a quantitative descriptive study therefore, descriptive statistics (percentages and frequencies) are used in order to analyze and describe the data collected, so the study does not compute statistical significance nor does it conduct any type of inferential tests such as correlations, regression, t-tests, ANOVA, etc.

Table 62

The provision/possession of each factor and the importance of each factor for each task.

NA tasks	Factors		% of provision/ possession	Rank (within category) (See note 2 below)	% of Importance	Rank (within each task) (See note 2 below)
Task 1	(A) Environment al supports	A1: Data	28.1%	2	74%	4
		A2: Instruments	57.3%	1	93.7%	2
		A3: Incentives	25%	3	58.3%	5
	(B) Individual repertory	B1: Knowledge	95.8%	1	76.1%	3
		B2: Capacity	See note 1 below	-	See note 1 below	-
		B3: Motives	93.7%	2	95.8%	1
Task 2	(A) Environment al supports	A1: Data	31.4%	2	63.9%	4
		A2: Instruments	56.9%	1	93%	2
		A3: Incentives	24.8%	3	51.2%	5
	(B) Individual repertory	B1: Knowledge	98.9%	1	84.9%	3
		B2: Capacity	See note 1 below	-	See note 1 below	-
		B3: Motives	96.5%	2	97.7%	1
Task 3	(A) Environment al supports	A1: Data	33.4%	2	71.6%	4
		A2: Instruments	54.3%	1	93.8%	2
		A3: Incentives	30.8	3	55.5%	5
	(B) Individual repertory	B1: Knowledge	93.3%	2	85.1%	3
		B2: Capacity	See note 1 below	-	See note 1 below	-
		B3: Motives	96.3%	1	98.8%	1
Task 4	(A) Environment al supports	A1: Data	30.8%	2	67.9%	4
		A2: Instruments	48.2%	1	90.1%	2
		A3: Incentives	26%	3	53%	5
	(B) Individual repertory	B1: Knowledge	95.1%	2	82.7%	3
		B2: Capacity	See note 1 below	-	See note 1 below	-
		B3: Motives	98.1%	1	98.7%	1

Note1: It was taken for granted that the capacity (the possession of physical and intellectual ability) to perform each task is mandatory, and performers must be physically and intellectually capable to perform each task; therefore, the participants were not asked about the possession and importance of factor B2; instead they were asked to provide information regarding their satisfaction about their capabilities in performing each task.

Note2: This ranking is a logical ranking that indicates only that one data point is ranked higher or lower than other points based on percentage as descriptive statistics and has nothing to do with inferential statistic. Because this study is not incorporating classical hypothesis testing, this type of statistics is not used in this study, and there is no need to conduct it. Additionally, this study is a quantitative descriptive study therefore, descriptive statistics (percentages and frequencies) are used in order to analyze and describe the data collected, so the study does not compute statistical significance nor does it conduct any type of inferential tests such as correlations, regression, t-tests, ANOVA, etc.

Table 63

The importance of each factor for all NA tasks.

Factors	NA tasks	% of Importance	% Average	Rank (within category) (See note 2 below)	Rank (Overall) (See note 2 below)
(A) Environmental supports					
A1: Data	Task 1	74%	69.35%	2	**4**
	Task 2	63.9%			
	Task 3	71.6%			
	Task 4	67.9%			
A2: Instruments	Task 1	93.7%	92.65%	1	**2**
	Task 2	93%			
	Task 3	93.8%			
	Task 4	90.1%			
A3: Incentives	Task 1	58.3%	54.50%	3	**5**
	Task 2	51.2%			
	Task 3	55.5%			
	Task 4	53%			
(B) Individual repertory					
B1: Knowledge	Task 1	76.1%	82.20%	2	**3**
	Task 2	84.9%			
	Task 3	85.1%			
	Task 4	82.7%			
B2: Capacity	Task 1	See note 1 below	-	-	**-**
	Task 2	See note 1 below			
	Task 3	See note 1 below			
	Task 4	See note 1 below			
B3: Motives	Task 1	95.8%	97.75%	1	**1**
	Task 2	97.7%			
	Task 3	98.8%			
	Task 4	98.7%			

Note1. It was taken for granted that the capacity (the possession of physical and intellectual ability) to perform each task is mandatory, and performers must be physically and intellectually capable to perform each task; therefore, the participants were not asked about importance of factor B2; instead they were asked to provide information regarding their satisfaction about their capabilities in performing each task.

Note2: This ranking is a logical ranking that indicates only that one data point is ranked higher or lower than other points based on percentage as descriptive statistics and has nothing to do with inferential statistic. Because this study is not incorporating classical hypothesis testing, this type of statistics is not used in this study, and there is no need to conduct it. Additionally, this study is a quantitative descriptive study therefore, descriptive statistics (percentages and frequencies) are used in order to analyze and describe the data collected, so the study does not compute statistical significance nor does it conduct any type of inferential tests such as correlations, regression, t-tests, ANOVA, etc.

Summary

This chapter presented the findings as related to the two main research questions. The findings for research question one discussed the frequency of performing each key task of NA, and the findings for research question two discussed the factors that impact the conduct of each task as perceived by HPI practitioners in terms of the provision/possession and the importance of each. The following chapter, chapter 5, presents a discussion of those findings.

CHAPTER 5 DISCUSSION

This chapter highlights the important findings of the study and discusses these findings in terms of existing literature. Implications of the study towards the professional practice of HPI and Instructional Technology (IT) fields are presented. This chapter also suggests recommendations for HPI practitioners and organizations interested in conducting NA, as well as recommendations for future research. The limitations on the study and a conclusion are also presented in this chapter.

The current study sought to empirically examine two research questions: The first question was intended to explore the prevalence of the four tasks of NA identified in this study as key tasks. The second question was intended to discover the factors that impact the conduct of each key task. Six factors were determined to be tested as related to each task in terms of two variables, the provision/possession and importance of each factor while conducting each task.

Important Findings of research question one:

This study sought to investigate how often HPI practitioners perform each key task when conducting NA. The results showed that there were no considerable differences in terms of the frequency and percentage of performing each task while conducting NA by HPI practitioners. So, the four tasks (developing a plan, collecting data, determining a performance gap, and determining the cause) were noticeably prevalent, and practitioners tended to perform those tasks frequently.

This finding was consistent with the existing literature that has been extensively discussed in chapter two (e.g Hannum and Hansen, 1989; Kaufman, 1991; Rummler & Brache, 1995; Witkkin & Altschuld, 1995). So, after reviewing and analyzing several seminal models of NA, four tasks have been determined as key tasks of NA used in those models. Therefore, these four tasks were considered as commonly used tasks from the theoretical aspect, so too does the practical aspect as a notable result of this study. Consequently, both aspects were aligned.

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Additionally, this finding was not surprising considering the characteristics of the study's sample where the demographic information about the participants showed that 84.4% of them hold doctorate or master's degrees, and the vast majority of those degrees were related to learning and performance improvement, and NA was a subject or a part of academic/professional training courses participants have taken. Therefore, practitioners with such characteristics were expected to be knowledgeable about the subject matter, NA tasks. In other words, practitioners with high level degrees tend to apply what they have learned about NA.

This result, however, may have been affected by the methodology used in the current study. The instrument asked participants to provide a general view or perception about how often they perform each task when conducting NA no matter, for example, how, where, when, etc. they used each task. In other words, if the instrument was designed for a closer view of more in-depth details, the instrument would have been precisely designed to measure and detect those details; so it would most likely detect more differences. Yet, in the current study the instrument was targeted to measure a general view; perhaps that was why it detected fewer differences.

Important Findings of research question two:

This study also sought to determine factors that impact the use of each task of NA. Six factors were identified and determined to be examined as related to each task in terms of two variables: the provision/possession of each factor and the importance of each factor to each task. Initially, the six factors were categorized into two main groups: environmental factors and individual factors with three factors under each category.

For the first category, environmental factors: Information, Resources, and Rewards, the results showed that HPI practitioners strongly believed that these factors were mandatory for performing each task of NA; however, the organizations they worked with/for did not sufficiently

provide those essential factors. Thus, there was a gap between what practitioners believed to be highly important factors that help them perform each task as it should be and the provision of those factors by the organizations.

While the importance of the environmental support for the human performance was emphasized in the literature (Robinson & Robinson, 1995), the current study has found lack of provision of this essential support. There are several possible reasons for this contradiction. One reason can be attributed to the level of appreciation of the importance of these factors between practitioners and organizations. So, while practitioners were knowledgeable and well educated in what influenced their background and the knowledge they possessed about NA and the factors that impact the performance, the organizations did not share same level of understanding of the influential factors. Another possible reason could be related to the fact that practitioners did not explain the importance of these factors for organizations to agree on providing them while performing NA.

Additionally, the results showed that the importance of each environmental factor to each task was noticeably varied because of how each factor was perceived by HPI practitioners. In this category, the factor that appeared to be the most effective factor in all tasks was instruments/resources followed by data/information, and lastly the incentives/rewards factor was ranked as the least effective factor in this category. One possible reason that may explain this result is that this study showed that practitioners were already very motivated to perform NA, so that is why they indicated that incentives would not matter that much compared to instruments that they believed to be the most important factors organizations should provide them with.

For the second category (Individual factors), the three factors were addressed in different ways in which two factors (Knowledge and Motives) were addressed in terms of the possession

and importance of each one. The third factor (Capacity) was addressed in terms of how satisfied practitioners were with their capabilities in performing each task.

HPI practitioners had a positive attitude about themselves in terms of the possession of knowledge and motives while performing each task of NA. Interestingly, there was a conflict between the results of this study associated with these two factors and what Gilbert, the author of the Behavior Engineering Model (BEM), has emphasized regarding the importance of them. He argued that the environmental support factors are more important than the individual repertory factors in terms of improving performance (Richey et al. 2011); however, the current study presented a different point of view where HPI practitioners have perceived some individual factors as more important than most of the environmental factors. This result would be obvious if we look at the overall ranking of all six factors in terms of their importance to each task. The results show that the three most important factors were motives (97.75%) followed by instruments (92.65%), and knowledge (82.2%). Apparently, two of these three factors belong to the individual repertory factors.

In terms of the third factor in this category, capacity/physical and intellectual ability to perform, it was taken for granted that it was impossible for a practitioner to perform each task without being physically and intellectually capable; instead this study sought to explore how satisfied practitioners felt about their capabilities in performing each task. So, the result has shown that HPI practitioners had a positive attitude toward the satisfaction of being physically and intellectually capable of performing each task. In fact, this result was not surprising because it was consistent with the demographic information that they provided in which the vast majority of participants have been working as HPI practitioners for more than six years, involved in

conducting NA more than fifteen times, and conducted NA in three or more different organizations.

Finally, this study has found that the level of provision/possession of each factor was relatively the same in each task; for example, if the data is seen as one factor of the environmental factors across all tasks in terms of the provision of this factor by organizations, the percentages would be very close to each other (with task 1: 28.1%; with task 2: 31.4%; with task 3: 33.4%; with task 4: 30.8%). Similarly, the importance of each factor was ranked at the same level across all four tasks; for instance, knowledge as one factor of the individual factors was in the third place in terms of its importance in performing each task. Clearly, it can be inferred from this result that there were no considerable differences in terms of how each factor impacted each task. In other words, the factor that appears to rank in the first place as the most important factor to one task would be ranked the similarly with other tasks. Also, here this result may have been affected by the methodology used in the current study in which the instrument asked participants to provide a general view or perception about the provision/possession and importance of each factor and not to look in-depth for more details associated with each factor which in turn would result in a detection of more differences.

Implications and recommendations for professional practice

The findings from this study encourage HPI practitioners to use the four determined key tasks of NA as a general frame work when conducting NA. This is because the determination of these tasks was based on reviewing several NA models, and the results showed that these tasks appeared to be the most common ones performed when conducting NA. However, since this finding was concluded based on examining only the frequency and importance of the four tasks as they were perceived by HPI practitioners, not only should frequency and importance be considered

but also other important aspects such as the efficiency, effectiveness, and quality of each task when performing NA.

Moreover, and due to the fact that human performance is varied based on many variables and that the factors influencing performance are varied as well, HPI practitioners are strongly urged to use this study's results in order to develop their awareness of the factors that impact their performance while conducting NA and/or similar HPI practices, such as professional project evaluation, so that the factors that carry positive impact may be encouraged and the barriers or the factors that carry negative impact may be avoided. In addition, organizations (including CEOs, executives, managers, and supervisors of HPI professionals) that are interested in conducting NA in order to take advantage of its outcomes are also encouraged to benefit from the current study's results to identify corrective actions in any given operation; for example, results may be used in strategic planning or any proactive activities. Therefore, both organizations and HPI practitioners should be aware of the factors that impact human performance in order to contribute to managing and controlling the consumption of essential resources (time, effort, money, etc.) needed for any project (Harriott & Adams, 2013; Farcasiu & Prisecaru, 2012).

Generally, since the field of Instructional Design and Technology is advancing from Instructional Design to Human Performance Technology, it is recommended for all professionals in the field to benefit from the current study's findings in order to develop a better understanding of "the factors influencing human performance, so that they could apply them properly to improve the performance" (Bandhana, 2010); for example, understanding the factors that impact performance would help Instructional Design and Technology professionals in designing and implementing interventions for closing performance gaps.

Recommendations for future research

There are three recommendations for further studies. The first is associated with the four key tasks of NA identified in this study in which future researchers could work on determining and identifying common subtasks involved under each key task. The determination and identification of subtasks could follow the same process used in the current study starting with extracting the subtasks from the literature by studying several models of NA and then practically examining the use of the determined subtasks when conducting NA. Therefore, the instruments should be designed for a closer view and precise measurement looking for specific details in order to precisely determine the subtasks associated with each key task of NA.

The second area is associated with the six factors examined in the current study. The impact of these factors was examined in conjunction with NA tasks, so similarly the same factors could be examined with other practices in the field of Instructional Design and Technology, such as designing instructional and/or non-instructional interventions.

The third area is associated with the seven NA models addressed in this study. Since the current study only compared and contrasted these seven models in terms of the tasks used in each model, future research could empirically examine these seven models in order to determine the validity, reliability, effectiveness, appropriateness, and usefulness of each one.

Limitations

The current study had several limitations. One limitation was the sample size. A large number of surveys were sent through email to HPI practitioners who are currently members of ISPI, International chapter and Michigan chapter as well as the researcher's own list of emails that included participants whom he knew were HPI practitioners. However, only 96 participants have provided valid responses to the survey. Therefore, this small sample size may affect the

generalizability of the results, especially the frequency of performing each task of NA. Another limitation was related to the number of NA models addressed in order to identify key tasks of NA. The four key tasks identified in the current study were based on reviewing and analyzing only seven models of NA; therefore, this limited number of models may have had an effect upon the generalizability of these four tasks considered as key tasks of NA; a large number of models would have been better in identifying a task or a group of tasks as key tasks of NA. This study was also limited by the factors determined as the main factors that impact human performance. The six factors addressed in the current study were determined based on only Gilbert's Behavior Engineering Model (BEM); therefore, these six factors may not have been representative of all impacting factors on human performance, so the generalizability of these factors may have been impacted by this limitation. Finally, since the data used in the current study was based on self-perception (presenting the truth according to what respondents think), the data were not independently verifiable; as a result, the findings drawn from such data were not necessarily independently verifiable facts.

Conclusion

This study explored the prevalence of key tasks of NA and the factors that impacted the conduct of each task as perceived by HPI practitioners. Four tasks were identified as key tasks of NA: 1- Developing a plan for NA, 2- Collecting data about the desired performance (What should be) and the current performance (What is), 3- Determining the actual need or gap in performance, and 4- Determining the cause(s) of the performance gap(s). The identification of these four tasks was based on reviewing and analyzing seven seminal models of NA in which these tasks were the most common ones used. Additionally, six factors were determined to be examined as related to each key task. The determination of these six factors was based on one well known model in the

field of HPI, the Behavior Engineering Model (BEM) which identified six factors as the most effective factors on human performance. The model placed these six factors into two categories: (A) Environmental supports factors: Data, Instruments, and Incentives; and (B) Individual repertory factors: Knowledge, Capacity, and Motives. Each one of these six factors was examined in terms of two variables: (a) the provision/possession of each factor while performing each task, and (b) the importance of each factor to perform each task as it should be.

An online survey was sent through email to HPI practitioners, and participants were asked to provide some demographic information and answer twelve questions associated with each task. The valid responses were analyzed, and the study resulted in the following conclusions:

1. The four key tasks were noticeably prevalent, and practitioners tended to perform those tasks frequently when conducting NA. So, because they were considered commonly used from the theoretical aspect, so too were they deemed the same from the practical aspect.

2. The environmental factors were believed to be mandatory to performing each task; however, there was a gap between what practitioners believed in to be highly important factors and the provision of those factors by the organizations where the provision of these factors was insufficient.

3. The environmental factors were noticeably varied based on their importance to all tasks. The factor that appeared to be the most effective was instruments/resources followed by data/information, and lastly incentives/rewards.

4. In the Individual factors, HPI practitioners had a positive attitude about themselves in terms of the possession of knowledge and motives while performing each task.

5. In the overall ranking, three factors were ranked as the most important factors to all tasks: Motives came first, followed by Instruments, and last Knowledge. Apparently, two of these three factors belong to the individual repertory factors.

6. HPI practitioners had a positive attitude toward the satisfaction of being physically and intellectually capable of performing each task.

7. There were no notable differences in terms of how each factor impacted each task, so each individual factor had the same level of importance to all tasks.

APPENDIX A - RESEARCH INFORMATION SHEET

Title of Study: The Prevalence of Key Needs Assessment Tasks As Perceived by Human Performance Improvement Practitioners

Principal Investigator (PI): Hasan Alzahrani

Purpose

Because you are a Human Performance Practitioner, you are being asked to participate in a research study about specific tasks of needs assessment and to what extent they are being used when conducting needs assessment as well as the factors that impact the use of each task. This study is being conducted at Wayne State University.

Please read this form and ask any questions you may have before agreeing to be in the study.

This research study aims to investigate the frequency of conducting specific tasks of needs assessment and the factors that impact the use of each task as they are perceived by Human Performance Improvement practitioners. This study will help in better defining the critical task of needs assessment. It will help also in determining (a) the driving factors that encourage Human Performance Improvement practitioners to conduct each task, and (b) the barriers that impact the use of each task so they may be avoided when conducting needs assessment.

Study Procedures

If you agree to take part in this research study, you will be asked to complete an online survey related to this study about specific tasks of needs assessment and to what extent they are being used in different organizations as well as the factors that impact the use of each task.

This study is entirely voluntary, so you may withdraw at any time. Your responses will be kept confidential. There is no compensation for your participation. 15-20 minutes are needed to

complete the survey. You will be asked to provide some basic demographic information (level of education, HPI courses you have stadied, your experties as related to needs assessmen, etc.), and your experience-based opinion about conducting specific tasks of needs assessment. The survey must be completed in one sitting; it cannot be saved and returned to later.

Questions

If you have any questions about this study now or in the future, you may contact Hasan Alzahrani at the following phone number (313)358-6272. If you have questions or concerns about your rights as a research participant, the Chair of the Institutional Review Board can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Participation

By completing this survey you are agreeing to participate in this study. Participation in this research is for Human Performance Improvement practitioners who are familiar with conducting needs assessment; <u>if you are not a Human Performance Improvement practitioner nor familiar with conducting needs assessment, please do not complete this survey.</u>

Do you agree to participate in this study?

☐ Yes

☐ No

APPENDIX B - THE RESEARCH SURVEY (DEMOGRAPHIC INFORMATION)

Section 1: Demographic information

1. What is the highest degree or level of education you have completed?

| Doctorate | Master's | Bachelor's | Other (Please specify) |

2. Is the degree you have completed related to learning and performance improvement (e.g. Human Performance Improvement (HPI), Instructional Design, Learning and Development, Human Resource, etc.)?

| Yes | No |

3. Have you studied any HPI academic/professional training courses (e.g. Needs Assessment, Performance Improvement, etc.)?

| Yes | No |

4. Was needs assessment a subject or a part of any of your academic/professional training courses you have completed?

| Yes | No |

5. How many years have you been working as an HPI practitioner?

| 1-5 years | 6-10 years | 11-15 years | More than 15 years |

6. How many times have you been involved in conducting needs assessment?

| 1-5 times | 6-10 times | 11-15 times | More than 15 times |

7. In how many organizations did you conduct needs assessment?

| 1 workplace | 2 different workplaces | 3 different workplaces | More than 4 different workplaces |

APPENDIX C - THE RESEARCH SURVEY

<u>Section 2</u>: The prevalence of key needs assessment tasks and the factors that impact the use of each one.

Task 1: Developing a plan for Needs Assessment, including but not limited to, the identification of Needs Assessment's goal(s), objective(s), stakeholders, timeline, and the level(s) of result (Mega/Social, Macro/Organizational, and/or Micro/Departmental).				
Q 1.1: When conducting needs assessment, I perform this task:				
Always	Most of the time	Sometimes	Rarely	Never
Q 1.2: When conducting needs assessment, the organization I work with/for provides me with information about my performance while performing this task (e.g. feedback about what I'm doing and description of what performance is expected of me):				
Always	Most of the time	Sometimes	Rarely	Never
Q 1.3: Providing information by the organization while performing this task (e.g. feedback about what I'm doing and description of what performance is expected of me) is:				
Very important	Important	Not sure	Unimportant	Very Unimportant
Q 1.4: When conducting needs assessment, the organization I work with/for provides me with the resources needed for performing this task (e.g. time, additional staff, clear procedures):				
Always	Most of the time	Sometimes	Rarely	Never
Q 1.5: Providing the resources needed for performing this task by the organization (e.g. time, additional staff, clear procedures) is:				
Very important	Important	Not sure	Unimportant	Very Unimportant
Q 1.6: When conducting needs assessment, the organization I work with/for provides me with adequate incentives contingent upon performing this task (e.g. financial, recognition, and encouragement):				
Always	Most of the time	Sometimes	Rarely	Never
Q 1.7: Providing adequate incentives by the organization while performing this task (e.g. financial, recognition, and encouragement) is:				
Very important	Important	Not sure	Unimportant	Very Unimportant
Q 1.8: I am confident that I possess enough knowledge and appropriate skills to allow me to perform this task as it should be:				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 1.9: The task could be accomplished successfully without me having the knowledge and skills personally:				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 1.10: I feel like I am capable of performing this task.				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 1.11: I am motivated to perform this task.				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 1.12: Being motivated to perform this task is:				
Very important	Important	Not sure	Unimportant	Very Unimportant

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Task 2: Collecting data about the desired performance (What should be) and the current performance (What is), including but not limited to, type of data, participants, sources, instrument(s), and analysis.

Q 2.1: When conducting needs assessment, I perform this task:

Always	Most of the time	Sometimes	Rarely	Never

Q 2.2: When conducting needs assessment, the organization I work with/for provides me with information about my performance while performing this task (e.g. feedback about what I'm doing and description of what performance is expected of me):

Always	Most of the time	Sometimes	Rarely	Never

Q 2.3: Providing information by the organization while performing this task (e.g. feedback about what I'm doing and description of what performance is expected of me) is:

Very important	Important	Not sure	Unimportant	Very Unimportant

Q 2.4: When conducting needs assessment, the organization I work with/for provides me with the resources needed for performing this task (e.g. time, additional staff, clear procedures):

Always	Most of the time	Sometimes	Rarely	Never

Q 2.5: Providing the resources needed for performing this task by the organization (e.g. time, additional staff, clear procedures) is:

Very important	Important	Not sure	Unimportant	Very Unimportant

Q 2.6: When conducting needs assessment, the organization I work with/for provides me with adequate incentives contingent upon performing this task (e.g. financial, recognition, and encouragement):

Always	Most of the time	Sometimes	Rarely	Never

Q 2.7: Providing adequate incentives by the organization while performing this task (e.g. financial, recognition, and encouragement) is:

Very important	Important	Not sure	Unimportant	Very Unimportant

Q 2.8: I am confident that I possess enough knowledge and appropriate skills to allow me to perform this task as it should be:

Strongly Agree	Agree	Not sure	Disagree	Strongly disagree

Q 2.9: The task could be accomplished successfully without me having the knowledge and skills personally:

Strongly Agree	Agree	Not sure	Disagree	Strongly disagree

Q 2.10: I feel like I am capable of performing this task.

Strongly Agree	Agree	Not sure	Disagree	Strongly disagree

Q 2.11: I am motivated to perform this task.

Strongly Agree	Agree	Not sure	Disagree	Strongly disagree

Q 2.1.12: Being motivated to perform this task is:

Very important	Important	Not sure	Unimportant	Very Unimportant

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Task 3: Determining the actual need or the gap in performance by comparing the current status (What is) to (What should be) status. If there is more than one need/gap, the needs/gaps are prioritized based on specific criteria.				
Q 3.1: When conducting needs assessment, I perform this task:				
Always	Most of the time	Sometimes	Rarely	Never
Q 3.2: When conducting needs assessment, the organization I work with/for provides me with information about my performance while performing this task (e.g. feedback about what I'm doing and description of what performance is expected of me):				
Always	Most of the time	Sometimes	Rarely	Never
Q 3.3: Providing information by the organization while performing this task (e.g. feedback about what I'm doing and description of what performance is expected of me) is:				
Very important	Important	Not sure	Unimportant	Very Unimportant
Q 3.4: When conducting needs assessment, the organization I work with/for provides me with the resources needed for performing this task (e.g. time, additional staff, clear procedures):				
Always	Most of the time	Sometimes	Rarely	Never
Q 3.5: Providing the resources needed for performing this task by the organization (e.g. time, additional staff, clear procedures) is:				
Very important	Important	Not sure	Unimportant	Very Unimportant
Q 3.6: When conducting needs assessment, the organization I work with/for provides me with adequate incentives contingent upon performing this task (e.g. financial, recognition, and encouragement):				
Always	Most of the time	Sometimes	Rarely	Never
Q 3.7: Providing adequate incentives by the organization while performing this task (e.g. financial, recognition, and encouragement) is:				
Very important	Important	Not sure	Unimportant	Very Unimportant
Q 3.8: I am confident that I possess enough knowledge and appropriate skills to allow me to perform this task as it should be:				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 3.9: The task could be accomplished successfully without me having the knowledge and skills personally:				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 3.10: I feel like I am capable of performing this task.				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 3.11: I am motivated to perform this task.				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 3.12: Being motivated to perform this task is:				
Very important	Important	Not sure	Unimportant	Very Unimportant

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Task 4: Determining the cause(s) of the performance gap(s) and recommending action(s) or solution(s) for addressing the determined cause(s).				
Q 4.1: When conducting needs assessment, I perform this task:				
Always	Most of the time	Sometimes	Rarely	Never
Q 4.2: When conducting needs assessment, the organization I work with/for provides me with information about my performance while performing this task (e.g. feedback about what I'm doing and description of what performance is expected of me):				
Always	Most of the time	Sometimes	Rarely	Never
Q 4.3: Providing information by the organization while performing this task (e.g. feedback about what I'm doing and description of what performance is expected of me) is:				
Very important	Important	Not sure	Unimportant	Very Unimportant
Q 4.4: When conducting needs assessment, the organization I work with/for provides me with the resources needed for performing this task (e.g. time, additional staff, clear procedures):				
Always	Most of the time	Sometimes	Rarely	Never
Q 4.5: Providing the resources needed for performing this task by the organization (e.g. time, additional staff, clear procedures) is:				
Very important	Important	Not sure	Unimportant	Very Unimportant
Q 4.6: When conducting needs assessment, the organization I work with/for provides me with adequate incentives contingent upon performing this task (e.g. financial, recognition, and encouragement):				
Always	Most of the time	Sometimes	Rarely	Never
Q 4.7: Providing adequate incentives by the organization while performing this task (e.g. financial, recognition, and encouragement) is:				
Very important	Important	Not sure	Unimportant	Very Unimportant
Q 4.8: I am confident that I possess enough knowledge and appropriate skills to allow me to perform this task as it should be:				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 4.9: The task could be accomplished successfully without me having the knowledge and skills personally:				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 4.10: I feel like I am capable of performing this task.				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 4.11: I am motivated to perform this task.				
Strongly Agree	Agree	Not sure	Disagree	Strongly disagree
Q 4.12: Being motivated to perform this task is:				
Very important	Important	Not sure	Unimportant	Very Unimportant

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APPENDIX D - CONTENT VALIDITY TOOL

Dear:

In a research study being conducted at Wayne State University, the researcher is aiming to investigate the frequency of conducting the key tasks of needs assessment and factors that impact the use of each task as perceived by the Human Performance Improvement practitioners. This study will help to better define the critical task of needs assessment. It will also help in determining (a) the driving factors that encourage Human Performance Improvement practitioners to conduct each task, and (b) the barriers that impact the use of each task so they may avoided when conducting needs assessment. In order to determine the key tasks of needs assessment, the researcher has analyzed several needs assessment models, identified the common tasks used in those models, and synthesized the common tasks in four key tasks. . <u>It should be noted that considering a task as 'key' means it is an essential aspect of needs assessment, recognizing that it likely involves several detailed sub-tasks identified based on the situation where the needs assessment is being conducted.</u> Appendix 1 illustrates the steps and criteria the researcher has followed in identifying the key tasks. The four key tasks of needs assessment being examined are illustrated in a table on the following page.

Because you are a Human Performance Improvement expert, you are being asked to provide your opinion, suggestions, and/or concerns about considering the four identified tasks as key tasks of needs assessment.

If you have any question or need more information you may contact the researcher at: cellphone: 313-358-6272, or email: eh5053@wayne.edu

Thank you in advance for your cooperation; and your help is highly appreciated.

Sincerely,

Hasan Alzahrani

Doctoral Candidate in Instructional Technology at Wayne State University, Detroit, MI.

NA Phase	Key NA Task(s)	This task can be considered as a key task of needs assessment.		Suggestions
		Yes	No	
Pre-Assessment	**Task 1**: Developing a plan for NA including the identification of NA's purpose(s), goal(s) and objective(s).			
Assessment	**Task 2**: Collecting data about the desired performance (What should be) and the current performance (What is) including: type of data, participants, sources, instrument(s), and analysis.			
	Task 3: Determining the actual need or the gap in performance by comparing the current status (What is) to (What should be) status. If there is more than one need/gap, the needs/gaps are prioritized based on specific criteria.			
Post-Assessment	**Task 4**: Determining the cause(s) of the performance gap(s) and recommending action(s) or solution(s) for addressing the determined cause(s).			

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Appendix 1

<u>The steps and the criteria the researcher has followed in identifying the key tasks</u>

The seven NA models discussed in the current study (the models of Burton & Merrill , Hannum & Hansen , Kaufman , Robinson & Robinson , Rothwell & Kazanas , Rummler & Brache , and Witkin & Altschuld) have shown many similarities in terms of the tasks for conducting NA. The researcher has considered a task a common task if it has been addressed in three or more models. If the task is addressed in only two models, the task will be realized in table 1 but not considered as common NA task. If the task is discussed in only one model, the task then would not be mentioned in this study. Table 1 below shows the NA tasks that have been addressed in two or more models; each task is aligned with the models that it has been addressed in.

Table 1: Aligning each common task of needs assessment and the models indicate it.

NA Task	Models
Developing plan for NA	Hannum & Hansen
	Kaufman
	Rothwell and Kazanas
	Rummler and Brache
	Witkin and Altschuld
Determining NA level of result	Kaufman
	Rummler and Brache
Identifying NA's purpose(s), goal(s), and objective(s)	Burton and Merrill
	Rothwell and Kazanas
	Rummler and Brache
	Witkin and Altschuld
Collecting data, including: type, participants, sources, instrument(s), analysis	Hannum & Hansen
	Kaufman
	Robinson and Robinson
	Rothwell and Kazanas
	Rummler and Brache
	Witkin and Altschuld
Identifying the desired performance (What should be)	Burton and Merrill
	Kaufman
	Rummler and Brache
Identifying the current performance (What is)	Burton and Merrill

	Kaufman
	Robinson and Robinson
	Rummler and Brache
Determining need(s) or the gap(s) in performance	Kaufman
	Robinson and Robinson
	Rummler and Brache
Prioritizing gaps/needs based on specific criteria (e.g. urgency, cost of closing vs. ignoring, etc.)	Burton and Merrill
	Hannum & Hansen
	Kaufman
	Witkin and Altschuld
Determining the cause(s) of the gap(s) in performance	Hannum & Hansen
	Rummler and Brache
	Witkin and Altschuld
Evaluating Needs Assessment	Rummler and Brache
	Witkin and Altschuld

As shown in Table 1, there are eight tasks for needs assessment that have been addressed in three or more models; therefore, these eight tasks will be considered as common needs assessment tasks. These tasks were:

- Developing plan for NA

- Identifying NA's purpose(s), goal(s), and objective(s)

- Collecting data, including: type, participants, sources, instrument(s), analysis

- Identifying the desired performance (What should be)

- Identifying the current performance (What is)

- Determining need(s) or the gap(s) in performance

- Prioritizing gaps/needs based on specific criteria (e.g. urgency, cost of closing vs. ignoring, etc.)

- Determining the cause(s) of the gap(s) in performance

In fact, occurrence and sequence of needs assessment tasks can be divided into three main steps or phases: Pre-Assessment, Assessment, and Post-Assessment. Therefore, the researcher will

use these three main steps as criteria for merging and synthesizing the aforementioned eight tasks considering the occurrence and the sequence of these tasks. So, looking in-depth at these eight tasks shows that some of them can be merged to form one key needs assessment task. The eight tasks can be synthesized and combined into four major/key tasks. The four identified tasks will be considered as key needs assessment tasks to be addressed in the current study. These four key needs assessment tasks are:

Task 1: Developing a plan for NA including the identification of NA's purpose(s), goal(s) and objective(s).

Task 2: Collecting data about the desired performance (What should be) and the current performance (What is) including: type of data, participants, sources, instrument(s), and analysis.

Task 3: Determining the actual need or the gap in performance by comparing the current status (What is) to (What should be) status. If there is more than one need/gap, the needs/gaps are prioritized based on specific criteria.

Task 4: Determining the cause(s) of the performance gap(s) and recommending action(s) or solution(s) for addressing the determined cause(s).

Based on the criterion identified above, the key tasks are assigned as follow: Task 1 is occurred as a preassessment, Tasks 2 & 3 are occurred as a main assessment, and Task 4 is occurred as a postassessment. Table 3 illustrates the alignment between each phase and the assigned NA task(s).

Table 2: Needs Assessment phases and the key task(s) required in each phase.

NA Phase	Key NA Task(s)
Pre-Assessment	**Task 1**: Developing a plan for NA including the identification of NA's purpose(s), goal(s) and objective(s).
Assessment	**Task 2**: Collecting data about the desired performance (What should be) and the current performance (What is) including: type of data, participants, sources, instrument(s), and analysis.
	Task 3: Determining the actual need or the gap in performance by comparing the current status (What is) to (What should be) status. If there is more than one need/gap, the needs/gaps are prioritized based on specific criteria.
Post-Assessment	**Task 4**: Determining the cause(s) of the performance gap(s) and recommending action(s) or solution(s) for addressing the determined cause(s).

APPENDIX E - FACE VALIDITY TOOL

Dear: Human Performance Improvement Practitioner,

In a research study being conducted at Wayne State University, the researcher is aiming to investigate the frequency of conducting key tasks of needs assessment and the factors that impact the use of each task as perceived by the Human Performance Improvement practitioners. This study will help to better define the critical task of needs assessment. It will also help in determining (a) the driving factors that encourages Human Performance Improvement practitioners to conduct each task, and (b) the barriers that impact the use of each task so they may avoided when conducting needs assessment. In order to determine the key tasks of needs assessment, the researcher has analyzed several needs assessment models, identified the common tasks used in those models, and synthesized the common tasks into four key tasks. Categorizing a task as 'key' means it is an essential aspect of needs assessment, recognizing that it likely involves several detailed sub-tasks identified based on the situation where the needs assessment is being conducted.

Because you are a Human Performance Improvement practitioner, you are being asked to participate in a pilot study in order to determine the clarity (e.g., in wording, easy to grasp, smoothness, etc.) of the survey questions. The second page introduces the four key task of needs assessment along with the research questions. The third and the fourth pages are only the pages where you input your feedback. It should be noted that the 12 questions on pages 3&4 will be associated in the survey with each key task of needs assessment, so each task will be examined separately in regards to these 12 questions.

If you have any question or need more information you may contact the researcher at: cellphone: 313-358-6272, or email: eh5053@wayne.edu

Thank you in advance for your cooperation, and your help is highly appreciated.

Sincerely,

Hasan Alzahrani

Doctoral Candidate in Instructional Technology at Wayne State University, Detroit, MI.

<u>The key tasks of needs assessment that will be examined in the current study are:</u>

Task 1: Developing a plan for Needs Assessment, including but not limited to, the identification of Needs Assessment's goal(s), objective(s), stakeholders, timeline, and the level(s) of result (Mega/Social, Macro/Organizational, and/or Micro/Departmental).

Task 2: Collecting data about the desired performance (What should be) and the current performance (What is), including but not limited to, type of data, participants, sources, instrument(s), and analysis.

Task 3: Determining the actual need or the gap in performance by comparing the current status (What is) to (What should be) status. If there is more than one need/gap, the needs/gaps are prioritized based on specific criteria.

Task 4: Determining the cause(s) of the performance gap(s) and recommending action(s) or solution(s) for addressing the determined cause(s).

<u>The two main questions which guide the current study are:</u>

1- What is the frequency of using each key needs assessment task by Human Performance Improvement practitioners?

2- What are the factors that impact the use of each key needs assessment task as they are perceived by Human Performance Improvement practitioners?

Each task (in page 2) will be added here, and then examined one at a time according to the following questions:

Note: you will see the phrase *'this task'* repeatedly; it refers to the task being examined (e.g., task #1 in page 2)

Questions	To me, this question was	
	Clear	**Unclear** Please specify why, and how to improve.
Q 1: When conducting needs assessment, I perform this task:		
Always / Most of the time / Sometimes / Rarely / Never		
Q 2: When conducting needs assessment, the organization I work with/for provides me with information about my performance upon performing this task (e.g. feedback about what I'm doing and description of what performance is expected of me):		
Always / Most of the time / Sometimes / Rarely / Never		
Q 3: Providing information upon performing this task by the organization (e.g. feedback about what I'm doing and description of what performance is expected of me) is:		
Very important / Important / Not sure / Unimportant / Very Unimportant		
Q 4: When conducting needs assessment, the organization I work with/for provides me with the resources needed for performing this task (e.g. time, additional staff, clear procedures):		
Always / Most of the time / Sometimes / Rarely / Never		
Q 5: Providing the resources needed for performing this task by the organization (e.g. time, additional staff, clear procedures) is:		
Very important / Important / Not sure / Unimportant / Very Unimportant		

Q 6: When conducting needs assessment, the organization I work with/for provides me with adequate incentives contingent upon performing this task (e.g. financial, recognition, and encouragement):			
Always	Most of the time	Sometimes	Rarely	Never		

Q 7: Providing adequate incentives by the organization contingent upon performing this task (e.g. financial, recognition, and encouragement) is:

Very important	Important	Not sure	Unimportant	Very Unimportant

Q 8: I am confident that I possess enough knowledge and appropriate skills which allow me to perform this task as it should be:

Strongly Agree	Agree	Not sure	Disagree	Strongly disagree

Q 9: The task could be still accomplished successfully without me having the knowledge and skills personally:

Strongly Agree	Agree	Not sure	Disagree	Strongly disagree

Q 10: I feel like I am capable of performing this task.

Strongly Agree	Agree	Not sure	Disagree	Strongly disagree

Q 11: I am motivated to perform this task.

Strongly Agree	Agree	Not sure	Disagree	Strongly disagree

Q 12: Being motivated to perform this task is:

Very important	Important	Not sure	Unimportant	Very Unimportant

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APPENDIX F - PARTICIPANTS' DEMOGRAPHIC INFORMATION

1. What is the highest degree or level of education you have completed?

	Frequency	Percent	Valid Percent
Valid 1	33	34.4	34.4
2	48	50.0	50.0
3	11	11.5	11.5
4	4	4.2	4.2
Total	96	100.0	100.0
1= Doctorate, 2= Bachelor's, 3= Master's, 4= Other			

2. Is the degree you have completed related to learning and performance improvement?

	Frequency	Percent	Valid Percent
Valid 1	75	78.1	78.1
2	21	21.9	21.9
Total	96	100.0	100.0
1= Yes, 2= No			

3. Have you studied any Human Performance Improvemen academic/professional training courses?

	Frequency	Percent	Valid Percent
Valid 1	93	96.9	96.9
2	3	3.1	3.1
Total	96	100.0	100.0
1= Yes, 2= No			

4. Was needs assessment a subject or a part of any of your academic/professional training courses?

	Frequency	Percent	Valid Percent
Valid 1	91	94.8	94.8
2	5	5.2	5.2
Total	96	100.0	100.0
1= Yes, 2= No			

5. How many years have you been working as an Human Performance

Improvement practitioner?

		Frequency	Percent	Valid Percent
Valid	1	18	18.8	18.8
	2	11	11.5	11.5
	3	15	15.6	15.6
	4	52	54.2	54.2
	Total	96	100.0	100.0
1= 1-5 years, 2= 6-10 years, 3= 11-15 years, 4= More than 15 years				

6. How many times have you been involved in conducting needs assessment?

		Frequency	Percent	Valid Percent
Valid	1	15	15.6	15.6
	2	11	11.5	11.5
	3	10	10.4	10.4
	4	60	62.5	62.5
	Total	96	100.0	100.0
1= 1-5 times, 2= 6-10 times, 3= 11-15 times, 4= More than 15 times				

7. In how many organizations did you conduct needs assessment?

		Frequency	Percent	Valid Percent
Valid	1	15	15.6	15.6
	2	11	11.5	11.5
	3	10	10.4	10.4
	4	60	62.5	62.5
	Total	96	100.0	100.0
1= 1 workplace, 2= 2 different workplaces, 3= 3 different workplaces, 4= More than 4 different workplaces				

APPENDIX G - IRB APPROVAL

WAYNE STATE UNIVERSITY

IRB Administration Office
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://irb.wayne.edu

CONCURRENCE OF EXEMPTION

To: Hasan Alzahrani
College of Education

From: Dr. Deborah Ellis _C. Zohodek_ _2-2_
Chairperson, Behavioral Institutional Review Board (B3)

Date: February 03, 2016

RE: **IRB #:** 011916B3X

Protocol Title: The Prevalence of Key Needs Assessment Tasks As Perceived by Human Performance Improvement Practitioners

Sponsor:

Protocol #: 1601014561

The above-referenced protocol has been reviewed and found to qualify for **Exemption** according to paragraph #2 of the Department of Health and Human Services Code of Federal Regulations [45 CFR 46.101(b)].

- Revised Social/Behavioral/Education Exempt Protocol Summary Form (revision received in the IRB office 02/03/15)
- Research Protocol - Dissertation (dated 2015 received in the IRB office 01/04/16)
- Research Information Sheet
- Data Collection Tool: Survey

This proposal has not been evaluated for scientific merit, except to weigh the risk to the human subjects in relation to the potential benefits.

- Exempt protocols do not require annual review by the IRB.
- All changes or amendments to the above-referenced protocol require review and approval by the IRB **BEFORE** implementation.
- Adverse Reactions/Unexpected Events (AR/UE) must be submitted on the appropriate form within the timeframe specified in the IRB Administration Office Policy (http://irb.wayne.edu/policies-human-research.php).

NOTE: Forms should be downloaded from the IRB Administration Office website http://irb.wayne.edu at each use.

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ABSTRACT

THE PREVALENCE OF KEY NEEDS ASSESSMENT TASKS AS PERCEIVED BY HUMAN PERFORMANCE IMPROVEMENT PRACTITIONERS

by

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This study explores the prevalence of key tasks of Needs Assessment (NA) and the factors that impacted the conduct of each task as perceived by Human Performance Improvement (HPI) practitioners. The study is motivated by two research questions: (1) What is the frequency of using each key NA task by HPI practitioners? (2) What are the factors that impact the use of each key NA task as they are perceived by HPI practitioners? Four tasks were identified as key tasks of NA, and six factors were determined to be examined as related to each key task in terms of two variables: (a) the provision/possession of each factor while performing each task, and (b) the importance of each factor to perform each task as it should be. The identification of the four key tasks was based on reviewing and analyzing seven seminal models of NA, and the six factors were determined based on one well known model in the field of HPI, the Behavior Engineering Model (BEM). Literature on NA has lack of empirical studies that focus on comparing and contrasting different NA models in terms of the tasks/steps used for conducting NA, the prevalence of using each task by HPI practitioners, and the factors that impact the use of each task. Therefore, the main purpose of the current study was to contribute in closing this gap in literature. An online survey

was used for collecting data form HPI practitioners. The findings from the research show that the four key NA tasks were noticeably prevalent, the overall ranking of the six factors shows that three factors were ranked as the most important ones to all tasks: Motives, Instruments, and Knowledge. Additionally, there were no notable differences in terms of how each factor impacted each task, so each individual factor had the same level of importance to all tasks. This study helps practitioners and organizations to managing and controlling the consumption of essential resources needed for any project by advancing the understanding of the key tasks of NA and the factors impacting human performance.

AUTOBIOGRAPHICAL STATEMENT

Hasan Alzahrani is currently a lecturer in the department of Instructional Technology at King Saud University in Riyadh, Saudi Arabia. He earned his Master's degree in Instructional Technology at King Saud University in 2009 and his PhD in Instructional Technology at Wayne State University in Detroit, Michigan in 2016.