

A Systematic Review of Task-Based Needs Analysis in L2 Course Design for Specialized Contexts: Trends, Methods, and Challenges

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Abstract—Task-based needs analysis (TBNA) is widely recognized as a critical first step in designing second language (L2) courses, ensuring that language instruction reflects real-world contexts and professional demands. While numerous studies have addressed needs analysis (NA) practices, systematic reviews focusing specifically on NA methodologies remain scarce. This systematic review explores the prevailing trends, key methodological approaches, and major challenges in implementing TBNA within the context of Language for Specific Purposes (LSP). Adhering to the PRISMA guidelines, this review analyzed 26 empirical studies published before Feb. 1, 2025, which were selected from 744 initial records retrieved from Scopus and Web of Science databases. The findings indicate that most TBNA studies adopt methods inspired by Long (2005), with an emphasis on triangulation through diverse data sources and mixed methodologies. However, significant challenges persist, including reliance on inadequately validated tools, insufficient use of onsite observations, and the labor-intensive nature of data analysis. To address these issues, this review suggests the potential integration of modern educational technology and proposes a practical framework to improve the implementation of NA in LSP course design. This review provides a comprehensive overview of the current TBNA landscape, identifies key gaps, and offers actionable insights for researchers and educators, while highlighting future directions for TBNA in LSP contexts.

Index Terms—Task-Based Needs Analysis (TBNA), course design, Language for Specific Purposes (LSP), Artificial Intelligence (AI)

I. INTRODUCTION

Needs analysis (NA) has long been recognized as a fundamental process in language curriculum design (Richards, 2001; Brown, 2016; Lear, 2021; Basturkmen, 2022), yet it has not always received the attention it deserves. As a systematic approach to identifying learners' language needs, NA ensures that language instruction aligns with real-world communication demands (Long, 2005). Within Language for Specific Purposes (LSP), NA is particularly critical, as it provides empirical insights into the linguistic and communicative competencies required in specialized professional contexts (Gilbert, 2003; Serafini et al., 2022). Among the development of NA theory and practice, task-based needs analysis (TBNA) has emerged as a key approach, emphasizing the identification of real-world tasks to inform syllabus design (Ellis, 2005, 2021; Belcher, 2006; Serafini et al., 2015). By focusing on the actual tasks professionals engage in, TBNA helps bridge the gap between language instruction and workplace communication (Long, 2015). Therefore, further research on TBNA is relevant and essential for improving L2 instruction in professional settings due to its potential to enhance the effectiveness of Language for Specific Purposes (LSP) courses.

Given the critical role of needs analysis in LSP course design, considerable efforts have been made to enhance its effectiveness and methodological rigor. In the past decades, scholars have proposed various frameworks to improve needs analysis practices (e.g., Munby, 1978; Hutchinson & Waters, 1987; Serafini & Torres, 2015). Unlike traditional approaches, which focus on the target situation (Munby, 1978) or student-centered learning (Hutchinson & Waters, 1987), task-based needs analysis (TBNA) emphasizes the use of "tasks" to inform a more tailored syllabus (Long, 2005). Currently, researchers are mainly concerned with the methodology of selecting the proper target tasks (Serafini et al., 2015), degree of difficulty, task design, and manipulating the task factors according to the cognitive theory to enhance the task sequence (Robinson, 2015; Malicka et al., 2019).

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Although there have been significant advancements in needs analysis (NA) methodologies, research on task-based needs analysis (TBNA) remains fragmented, with limited comprehensive syntheses. One notable review was conducted by Serafini, Lake, and Long (2015), which analyzed NA practices between 1984 and 2014 and advocated methodological rigor through triangulation, combining data from diverse sources (insiders and outsiders), and integrating qualitative and quantitative methods. Since then, however, systematic literature reviews that consolidate empirical findings specifically on TBNA have been scarce (Serafini et al., 2022). This gap makes it difficult for researchers to gain a holistic understanding of TBNA's evolution, effectiveness, and limitations in specialized L2 course designs. By conducting this systematic review, this study seeks to bridge that gap by providing a comprehensive synthesis of existing TBNA research. The findings will not only offer scholars a clear perspective on methodological trends and challenges but also equip course designers with effective, research-informed NA practices to enhance language instruction in professional contexts.

II. LITERATURE REVIEW

A. *The Origins of Task-Based Needs Analysis (TBNA) in TBLT*

Task-Based Language Teaching (TBLT), rooted in Communicative Language Teaching (CLT), emphasizes meaningful interaction and authentic language use. It breaks through the limitations of traditional grammar-based instruction by placing tasks at the core of teaching (Ellis, 2003; Nunan, 2004). Since the late 20th century, scholars such as Long (1985) and Skehan (1996) have helped establish TBLT as a mainstream approach through task definition, framework development, and methodological promotion. Research has shown that task-based teaching significantly enhances learner engagement and language production, particularly in communicative contexts (Bryfonski & McKay, 2017; Ellis, 2018). In recent years, task-based needs analysis (TBNA) has gained increasing attention as a cornerstone for TBLT course design.

The value of TBLT is especially evident in Language for Specific Purposes (LSP) fields such as healthcare and aviation, where language proficiency directly impacts professional performance (Ellis, 2021; Long & Ahmadian, 2022). Therefore, designing effective curricula in these contexts requires precise alignment with learners' real communicative needs. To address this, Task-Based Needs Analysis (TBNA) introduces a key innovation by reconstructing a task-centered curriculum framework. It systematically analyzes real-world tasks (e.g., patient-physician dialogues, airline safety instructions) within the target context (Long, 2005). This task-centered approach not only ensures the authenticity of course content but also directly fosters the development of communicative competence in vocational settings.

B. *The Conceptual Evolution of Needs Analysis and TBNA*

Munby's (1978) Communication Needs Processor (CNP) was the first systematic model of Needs Analysis (NA), offering a structured way to identify learners' target situation needs through communicative variables like topic, participants, medium, and setting. This approach brought unprecedented rigor to analyzing language demands in professional and academic contexts. However, its reliance on static variables and theoretical scenarios limited its adaptability to real-world contexts, as it often lacked empirical learner data (West, 1994; Basturkmen, 2015).

Later frameworks, including Target Situation Analysis (TSA) and Present Situation Analysis (PSA) (Hutchinson & Waters, 1987; Dudley-Evans & St. John, 1998), sought to improve NA by identifying learners' future language needs (TSA) and assessing their current abilities (PSA). These models help bridge the gap between learners' present skills and their target requirements. Yet, they still depend heavily on subjective input from stakeholders, often failing to fully capture authentic communicative demands (Hyland, 2006; Long, 2005; Serafini, Lake & Long, 2015).

Task-Based Needs Analysis (TBNA) emerged as a more robust, data-driven alternative. Unlike earlier models that relied on perceptions, TBNA systematically examines real-world communicative tasks through workplace observation and discourse analysis (Long, 2005; Serafini et al., 2015). This approach provides a stronger empirical foundation for curriculum design and aligns with Task-Based Language Teaching (TBLT), which prioritizes authentic, relevant tasks (Ellis, 2003).

By focusing on the actual tasks learners perform in their target environments, TBNA has become essential for Language for Specific Purposes (LSP) courses (Hyland, 2006; Oliver & Lambert, 2020). It ensures that course content reflects real workplace communication needs, leading to more targeted curricula, better learning outcomes, and higher learner satisfaction (Long, 2005; Oliver & Lambert, 2020). TBNA thus marks a significant advancement in making NA both rigorous and practical.

C. *Challenges in TBNA Implementation*

Despite its advantages, TBNA still faces methodological and practical challenges. One major issue is the lack of a standardized, universally applicable framework, as different studies adopt varying data collection techniques and analytical methods, making it difficult to compare findings across contexts (Bryfonski & McKay, 2017; Serafini et al., 2022). Additionally, while researchers have increasingly incorporated triangulated methods, consulting multiple data sources and combining quantitative and qualitative approaches, inconsistencies in implementation and reporting practices persist (Serafini et al., 2022). Furthermore, TBNA is labor-intensive and time-consuming, requiring

researchers to gain access to professional environments for authentic data collection, which is often restricted due to ethical or logistical constraints (Long, 2005; Cowling, 2007; Oliveira & Lemos, 2022).

Given these challenges, there remains a pressing need for systematic reviews that consolidate empirical findings and provide a holistic perspective on TBNA methodologies. Long (2005) is a landmark work on TBNA that emphasizes empirical, data-driven approaches to identifying learners' language needs. Unlike traditional needs analysis (NA) methods that rely on self-reports and intuition, Long (2005) advocates task-based needs analysis (TBNA), which gathers real-world linguistic data through observations, interviews, discourse analysis, and ethnographic studies. His work highlights the importance of triangulating multiple data sources (e.g., learners, professionals, and domain experts) to ensure accuracy and validity in needs analysis. While Serafini et al. (2015) examined NA practices from 1984 to 2014, their review did not specifically focus on "task" needs analysis for language learning in the working field. Furthermore, given the continuous advancements in English education, generative AI technologies, such as ChatGPT, offer significant potential benefits for second language teaching and learning (Crompton & Burke, 2023) and course design (Buckley, 2024). However, few studies have integrated AI into TBNA practice to enhance its methodological effectiveness. To address this gap, the present study provides a systematic synthesis of TBNA research, equipping researchers and course designers with a clear framework for implementing effective NA practices in LSP contexts.

This systematic review critically examines the utility of TBNA in LSP course design by identifying trends, methodological components, limitations, and challenges shaping its effectiveness. In the end, it suggests the potential integration of AI to enhance the methodological effectiveness of TBNA. To achieve these objectives, the study addresses the following research questions:

Question 1: What are the current Task-based needs analysis (TBNA) practice trends?

Question 2: What are the key components of methodological practice in TBNA for language for specific purposes?

Question 3: What are the primary limitations and challenges during the practice of the task-based needs analysis methods?

III. METHODS

A systematic literature review was conducted to examine the utility of task-based needs analysis in language for specific purposes (LSP). This systematic literature review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021) to ensure a comprehensive and transparent synthesis of existing research on the utility of task-based needs analysis in LSP course design. The review protocol was registered in the Open Science Framework (OSF) on September 21, 2024 (https://osf.io/bmaqu/?view_only=e9227dbe383d472091ed85227ef3af49/) as "A Systematic Review of Task-Based Needs Analysis in L2 Course Design for Specialized Contexts: Trends, Methods, and Challenges." The PRISMA protocol guided all stages of the review process, including the development of the search strategy, selection criteria for studies, data extraction methods, and quality assessment procedures.

A. Eligibility Criteria

As the review focuses on studies on Task-Based Needs Analysis (TBNA) in Second Language (L2) learning for Specific Purposes (ESP) course design, the following criteria (Table 1) were used to determine the papers included in the review:

TABLE 1
THE INCLUSION CRITERIA AND EXCLUSION CRITERIA

Inclusion Criteria	Exclusion Criteria
Studies published in English	Non-English publications
Needs Analysis in LSP Contexts	Studies not relevant to LSP
Empirical studies focusing on identifying the language tasks in the workplace	Theoretical articles or conceptual frameworks without empirical evidence
Peer-reviewed articles or book chapters	Conference papers, dissertations, and proceedings papers

The implementation of these criteria is detailed in the subsequent data collection process.

B. Data Sources and Search Strategies

The review searches were conducted using the electronic databases Scopus and the Web of Science (WoS). These databases were selected due to their comprehensive coverage of high-quality, peer-reviewed research across various disciplines, including education and applied linguistics. Databases were searched separately by two researchers. The last search was run on Feb. 1, 2025. A combination of keywords related to task-based needs analysis, second language course design, specialized contexts, and language education was employed. To ensure we identified as many relevant studies as possible, we expanded our search terms and strategies. In collaboration with the co-author, we refined and combined search terms using Boolean operators. The keywords "Task" AND "Needs Analysis" were applied to the article title, abstract, and keywords in Scopus and to the topic field in Web of Science (WoS). The string links are

Scopus: TITLE-ABS-KEY (Task AND "Needs Analysis")

WoS: Task AND "Needs Analysis" (Topic)

The inclusion criteria were centered on research articles that investigated task-based needs analysis in L2 course design within specialized contexts and provided empirical evidence or theoretical insights. Also, the article had to be published in English. Additional resources were gathered by reviewing selected articles' reference lists.

C. Study Selection

As illustrated in the flow diagram of the screening and selection procedure (Fig. 1), the process consists of four key stages: identification, screening, eligibility assessment, and inclusion.

In the identification stage, two researchers collaboratively searched the Scopus and Web of Science (WoS) databases using the terms *Task AND "needs analysis"*. This broad search strategy captured all relevant studies, including those that may not explicitly reference "task-based" approaches in their titles or abstracts. Consequently, a wide range of articles related to needs analysis were considered at this stage. The search yielded 744 records, and their bibliographic information—including title, author(s), abstract, keywords, journal name, and year of publication—was exported to an Excel spreadsheet for further processing.

During the screening stage, 140 duplicate records were removed. The two researchers independently reviewed the remaining articles by examining their titles and abstracts. At this stage, 516 records were excluded for not aligning with the study's focus, specifically, studies that did not employ tasks as the central unit of empirical needs analysis (e.g., Liu et al., 2023; Gilabert, 2023; Grote & Oliver, 2022). Only studies that adopted task-based approaches (e.g., Serafini & Torres, 2015; Huang & Yu, 2023; Hoang et al., 2024) were retained. In cases of disagreement or uncertainty, the researchers discussed the inclusion criteria. If consensus could not be reached, the article was reserved for evaluation at the full-text review stage.

At the eligibility assessment stage, the full texts of the remaining articles were examined against predefined exclusion criteria. Sixty-six articles were excluded for the following reasons: published before 2000 ($n = 6$), not classified as empirical research ($n = 9$), lacking a focus on task-based approaches within the Language for Specific Purposes (LSP) context ($n = 30$), or being conference papers ($n = 10$). Additionally, 11 articles were removed due to content duplication or irretrievability. Four further relevant studies were identified through a manual search from reference lists during the full-text review.

To ensure the methodological rigor of the selected studies, the Mixed Methods Appraisal Tool (MMAT) was applied to assess study quality. Initially, two screening criteria determined whether the studies were empirical: (1) the clarity of the research questions and (2) the adequacy of data in addressing these questions. Studies meeting these criteria were then evaluated based on their methodological approach. Qualitative studies were assessed for the appropriateness of data collection and analysis methods; quantitative studies were evaluated for the validity of statistical methods and measurement tools; mixed-methods studies were examined for the extent of method integration. To minimize bias and enhance reliability, the review employed diverse data sources, maintained methodological transparency, and applied consistent standards for interpreting results. Studies that failed to meet quality benchmarks were excluded from the final selection. Ultimately, 26 empirical studies were included in this systematic review.

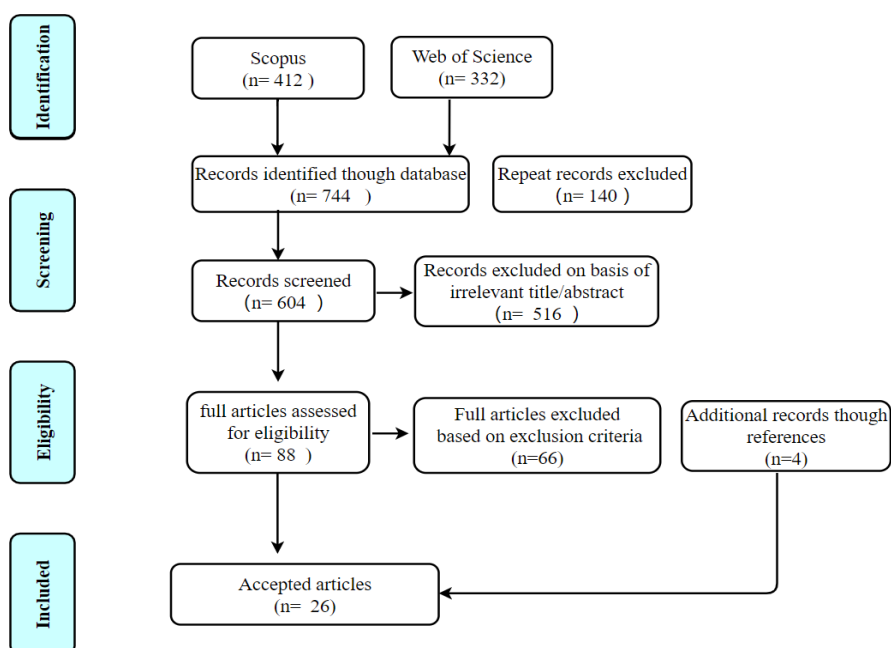


Figure 1. Flow Diagram of the Screening and Selection Procedure

D. Data Analysis

All 26 selected articles were imported into Mendeley, a reference management tool, and organized in a Microsoft

Excel spreadsheet for analysis. The researcher extracted key methodological details from each study, including language, domain, research aim, research questions, sample characteristics, instruments, research strategy, methods, results, limitations, and implications. Given this study's focus on examining prevailing trends, key methodological approaches, and major challenges in implementing TBNA, key data about context, country, domain, participants, and methods during the TBNA practices are summarized in Table 2. This table will be further reorganized and analyzed in the following section to highlight current trends and the interplay of core components within the needs analysis process.

In addition, the full-text articles were carefully reviewed to identify methodological limitations and practical challenges, which form the basis for the subsequent discussion on AI integration in TBNA. Further details regarding the data extraction process and the Excel spreadsheet are available on the protocol website.

(https://osf.io/bmaqu/?view_only=e9227dbe383d472091ed85227ef3af49).

TABLE 2
Summary of the task-based needs analysis of the selected articles
(https://osf.io/bmaqu/?view_only=e9227dbe383d472091ed85227ef3af49)

IV. RESULTS

This study discusses 26 articles on task-based needs analysis in language for specific purposes. Twenty (77%) of the selected articles are in the context of English for Specific Purposes (ESP), which accounts for the majority of language-related studies, while other languages (n=6, 23%) like Spanish, Japanese, Portuguese, and Korean are also studied. The majority of the research objectives of the 26 articles were involved in identifying the target tasks, surveying task frequency and difficulty, and syllabus design. Only the research objectives of Malicka et al. (2017) and Chaudron et al. (2005) involved task complexity and affective factors. In terms of the TBNA methodology, most of the studies were mixed-method (70%), while 30% were purely quantitative: Alibakhshi et al. (2021); De Castr (2020); Oliver and Lambert (2020); Kathpalia et al. (2019); Chan (2019); Malicka et al. (2017); Arias-Contreras and Moore (2022); Huang and Yu (2023). In terms of educational technology usage, only 4 studies (15%) utilized online surveys (e.g., Hillman & Long, 2020) or questionnaires (e.g., Alhadiah, 2021) to collect data.

The following part of this section discusses current trends, the key methodological components of TBNA practice, and the limitations and problems of the methodology.

A. Current Trends in TBNA

TBNA has shown its impact on the LSP context through an increasing number of published papers and the diverse distribution of target populations. Fig. 2 below illustrates the TBNA papers published before 2024. The line graph shows a steady increase in published papers, peaking in 2020 with six papers. The number of publications slightly decreased but remained steady between 2021 and 2024, which indicates steady academic interest in the field.

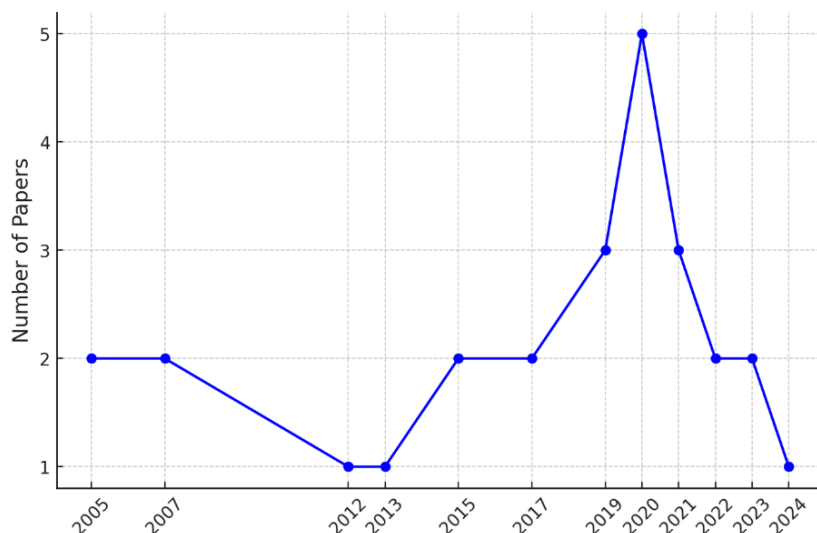


Figure 2. TBNA Papers Published by Year

Fig. 3, titled “The Domain of TBNA in LSP Context,” illustrates the diverse applications of TBNA across a range of professional and educational fields. The largest domains represented are Engineering (n = 4, 15%) and Business (n = 4, 15%), underscoring the significant role of TBNA in the technical and commercial sectors. A notable block within the treemap highlights research on Aboriginal vocational high school students in Western Australia, comprising three articles led by a single research group (Oliver et al., 2012, 2013, 2020, 2022). This cluster emphasizes localized educational and sociocultural needs, focusing on Aboriginal students' English language needs for future workplace

contexts. Other fields, including government and research institutions (Hillman & Long, 2020; Serafini et al., 2015), law (Yatroun, 2020), science (Kathpalia et al., 2019), and marine industries (De Castro, 2020), further demonstrate TBNA’s contribution to the public services and specialized professional sectors. Smaller yet equally significant domains, such as nursing (Huang & Yu, 2023), the arts (Lūka, 2007), tourism (Trang & Vo Tu Phuong, 2023), hotel reception (Malicka et al., 2017), agriculture (Arias-Contreras & Moore, 2022), and journalism (Gilabert, 2005), showcase TBNA’s adaptability across a wide array of contexts. Additionally, areas such as Korean language programs (Chaudron et al., 2005), summer courses (Iizuka, 2019), and employment preparation for Japanese companies (Cowling, 2007) illustrate TBNA’s flexibility in addressing specialized language and communication needs.

Overall, the treemap highlights TBNA’s versatility and capacity to meet specific demands of both broad and niche domains within the LSP context.



Figure 3. The Domain of TBNA in the LSP Context

B. Key Methodological Components in TBNA

Further analysis of the articles also revealed that most of the research methods (n=19, 73%) adopted the task-based NA theory of Long (2005), which later evolved to be more rigorous by adopting the triangulation method recommended by Serafini, Lake, and Long (2015). Table 3 illustrates the combination of key methodological components in TBNA implementation, which includes research objectives, sources, and methods, and the expected outcomes for each research objective. Additionally, a summary of the number and percentage of sources and methods is provided in Table 4.

TABLE 3
THE COMBINATION OF THE KEY METHODOLOGICAL COMPONENTS OF TBNA IMPLEMENTATION

Research Objectives	sources	methods	outcomes
To identify the target tasks in real life	(i)Insiders: Domain experts, practitioners, in-service learners	(i) Qualitative: Interview Participant or non-participant observation Open-ended survey	A series of target tasks that can be compiled into a questionnaire Target task type list
To sequence the most valuable tasks	(ii)Outsiders: Applied linguists, teachers, administrators	Professional documents	
To design the language course syllabus		(ii) Quantitative: Questionnaire	Language for Specific Purposes course syllabus
To collect authentic communication materials		(iii) Triangulation	Authentic task activities to inform the teaching plan

The first major research objective was to identify target tasks in real life. This was achieved by consulting insiders such as domain experts (n=12, 46%), practitioners (n=11, 42%), and in-service learners (n=3, 12%), such as teachers (Yatroun, 2020) and lecturers (Oliver et al., 2013), community members (Oliver et al., 2013), administrators (Cowling, 2007), and students (Kathpalia et al., 2019). Qualitative methods like semi-structured interviews (n=22, 85%) were mostly employed, followed by open-ended surveys (n=4, 15%) and participant or non-participant on-site observation (n=6, 23%). The outcomes were normally a series of target tasks that could be further compiled into a questionnaire. This approach allowed for a deeper understanding of the practical tasks individuals face in their specific domains, collecting valuable, authentic tasks for future syllabus design.

The second objective was to sequence these tasks according to task frequency and perceived difficulty. Sources involved both insiders and outsiders, such as applied linguists, teachers, and administrators. A quantitative questionnaire (n=9, 35%) was adopted to rate task frequency and perceived difficulty, along with observations and interviews. The results led to a target task type list. This helped in prioritizing tasks based on their importance and value, enabling educators and curriculum designers to focus on the most essential skills and activities for language learning.

The aim of designing the language course syllabus involves the participation of applied linguists (n=4, 15%), teachers (n=7, 27%), and administrators (n=5, 19%). Besides, surveys and analyses of professional documents and textbooks were also employed (n=4, 15%). The outcome led to the development of a language for specific purposes syllabus. This syllabus was tailored to meet the specific language needs of learners in different domains, ensuring its relevance and effectiveness.

The final objective was to collect authentic communication materials. Researchers highlighted the effectiveness of on-site observation (n=6, 23%). The result was designed authentic task activities that could inform classroom teaching. This was to ensure that language teaching was based on real-life communication scenarios, enhancing the learners' ability to apply language skills in practical situations.

Besides, eight (30%) research objectives also mentioned in these papers are "learners lack and need" (e.g., Oliver et al., 2013), and 2 (8%) selected articles (Malicka et al., 2017; Chaudron et al., 2005) explored "task complexity" as one of the research objectives.

TABLE 4
SUMMARY OF THE NUMBER AND PERCENTAGE OF SOURCES AND METHODS

Sources and methods	Number of Studies
Sources	
(i)Insiders:	
Domain experts,	12 (46%)
Practitioners	11 (42%)
In-service learners	3 (12%)
(ii)Outsiders:	
Applied linguists	4 (15%)
Teachers	7 (27%)
Administrators	5 (19%)
Methods	
(i)Qualitative:	
Interview	22 (85%)
Participant or non-participant observation	6 (23%)
Open-ended survey	4 (15%)
Professional documents	4 (15%)
(ii) Quantitative:	
Questionnaire	9 (35%)
(iii) Mixed	
	9 (35%)

C. Limitations and Challenges in TBNA

Four categories of limitations and challenges are primarily noticed during the practice of TBNA: sources, research tools, research methods, and data analysis methods (Table 5).

The limitation of documentary sources is that they lack social interaction and contemporaneity. Professional documents like career orientation data and literature data are valuable sources to obtain target tasks. Malicka et al. (2017) also recommended job description manuals as a good way to consult. However, Oliver et al. (2013) noted, "A limitation of both types of sources was that, because of their (necessary) focus on occupational tasks, aspects relating to social interaction at work were absent. Research that depends on literature may be constrained by the existing knowledge framework". Therefore, Malicka suggested that a greater variety of sources should be consulted.

Several studies (e.g., Ahmmed et al., 2020) have highlighted the limitations of research tools due to deficiencies in both design and administration. Ahmmed et al. (2020) declared "The questionnaire was based on the literature examined in this study (Ahmmed et al., 2020) and the Maritime English Model Course. However, the close-ended survey blocks the generation of new tasks." At the same time, insufficient openness of the questionnaire will also reduce the opportunity to obtain potentially relevant information (Serafini et al., 2015). In terms of sample selection, a low response rate is a common problem that needs to be improved. For example, the response rate of the host family questionnaire in Iizuka (2019) was only 59%. Iizuka (2019) reflected this low response rate is quite likely due to the mailed survey process in the administration.

Interview tools also have limitations. When there is a lack of valid questionnaires, the study may over-rely on interviews as a data collection method, which will increase the cost and complexity of the study. As Alibakhshi et al. (2021) stated in their study that interviews were used as the primary data collection method due to the lack of valid questionnaires. Different research methods, such as focus group discussions and observations, also reveal limitations in the application process. Kathpalia et al. (2017) adopted Focus Group Discussions to collect data and found it may not be comprehensive and in-depth in obtaining task requirements.

The limitations of TBNA methods have also been noted. Researchers (Yatroon, 2020; Oliver et al., 2012; Huang & Yu, 2023) emphasized the importance of oral (spoken) communication tasks, which require on-site data collection methods to gather authentic materials in the target context. As a result, the insufficient use of observation has been highlighted. Huang and Yu (2023) acknowledged that in ESP nursing research, on-site observation, particularly real-time nurse-patient interactions, was inadequate. This limitation restricted researchers' understanding of actual behaviors, affecting insights into target field activities and the design of effective interventions (Huang & Yu, 2023).

The limitation of data analysis methods will also affect the research results. Hillman and Long (2020) complained about the “labor-intensive” in analyzing data from the open-ended parts of the questionnaires. Meanwhile, Serafini and Torres (2015) figured that there is no widely agreed-upon sequencing criterion for target tasks to date. Trang and Vo Tu Phuong (2023) adopted a thematic analysis for target task types (TTT). However, they admitted that the theme analysis can be a time-consuming and laborious process and is highly subjective. Let alone, it requires manual analysis of the data, repeated reading of the data set, which is not only cumbersome, but the analysis results may be affected by the analyst’s subjective factors, thus affecting the objectivity and accuracy of the research conclusions.

TABLE 5
SUMMARY OF THE LIMITATIONS AND PROBLEMS IN TBNA PRACTICE

Category	Specific Limitation	Examples
Data Source Limitations	Narrow data scope (just one workplace)	Oliver et al. (2013); Malicka et al. (2017)
	Limitations of literature-based data	Ahmed et al. (2017)
Research Tool Problems	Questionnaire Design	
	•Unreasonable design (closed-ended questions)	Ahmed et al. (2020)
	•Lack of openness	Serafini et al. (2015)
	Improper sample administration	
Research Method Limitations	•Low response rates	Iizuka (2019)
	•Non-ideal sampling (convenience sampling, volunteer bias)	Iizuka (2019)
	•Over-reliance on interviews (Lack of a valid questionnaire)	Alibakhshi et al. (2021)
Data Analysis Issues	Focus Group Discussions (lack of depth)	Kathpalia et al. (2019)
	Insufficient use of field observation	Huang and Yu (2023)
	Challenges in Thematic Analysis (time-consuming, subjective)	Hillman and Long (2020); Trang and Vo Tu Phuong (2023)

V. DISCUSSION

This systematic organization provided a clear overview of the current state and emerging trends in task-based needs analysis. By analyzing the methodological components of TBNA practices and identifying existing limitations, this review suggests a possible framework for integrating AI, which may help enhance the methodological effectiveness of future TBNA research.

A. Current Trends in TBNA

With increasing advocacy for incorporating real-world communicative practices into second language instruction, Task-Based Needs Analysis (TBNA) has garnered sustained scholarly attention as a foundational step in the design of language courses for specific purposes (Grote & Oliver, 2022). Over the past two decades, academic interest in TBNA has grown significantly (Long, 2005; Serafini et al., 2015; Serafini & Torres, 2015), with notable applications expanding across a diverse range of professional domains, including engineering, business, nursing, and tourism. This diversification reflects a broader trend within Task-Based Language Teaching (TBLT) toward context-sensitive and need-driven curriculum design, underscoring TBNA’s increasingly pivotal role in shaping Language for Specific Purposes (LSP) instruction.

Beyond its use in English for Specific Purposes (ESP) contexts (Huang & Yu, 2023; Oliver & Lambert, 2020; Hoang et al., 2024), TBNA has been applied in a variety of language settings, such as Spanish (Serafini & Torres, 2015; Martin & Adrada-Rafael, 2017), Japanese (Hillman & Long, 2020), and Korean (Chaudron et al., 2005). This expansion illustrates the methodology’s potential for designing customized language curricula tailored to the specific communicative needs of diverse learner populations.

As TBNA continues to evolve, it is crucial to recognize that workplace communication is not solely defined by task-specific activities but is also deeply embedded within cultural and regional professional norms. Consequently, a standardized, one-size-fits-all approach to TBNA may fail to capture the nuanced needs of learners across different sociocultural and geographic contexts (Basturkmen, 2022). To better support L2 learners, TBNA practices must advance toward more contextually responsive and culturally informed curriculum designs, incorporating local professional discourse conventions, occupational practices, and cultural values.

Achieving this requires stronger collaboration between language educators and domain professionals to ensure that selected tasks authentically reflect real-world communicative expectations. Furthermore, enhanced partnerships between educational institutions and industry stakeholders can facilitate the development of more robust and transferable TBNA models, thereby improving the validity and scalability of task-based LSP curricula (Oliveira & Lemos, 2022).

B. Key Methodological Components in TBNA

The prevailing methodology across the selected studies aligns with Long’s (2005) TBNA framework, often supplemented by the comprehensive methodological checklist proposed by Serafini et al. (2015). The primary research

objectives identified include target task selection, task sequencing (typically based on frequency and difficulty), the collection of authentic language use materials, and syllabus design. To address these objectives, most studies adopt triangulation strategies, combining data from interviews, questionnaires, and document analysis to ensure methodological rigor and comprehensive data collection.

However, despite the widespread use of interviews and questionnaires, a notable limitation is the insufficient incorporation of onsite observation. Observation remains critical for capturing authentic workplace interactions and uncovering communicative behaviors that may not emerge through self-reporting methods. The underutilization of observational data constrains the depth and authenticity of task analyses, suggesting a need for more balanced methodological designs that integrate observational techniques alongside other data collection tools to strengthen the empirical basis of TBNA.

Furthermore, while many TBNA studies emphasize gathering data from domain professionals and practitioners (e.g., Martin & Adrada-Rafael, 2017; Chan, 2019; Hillman & Long, 2020), limited attention has been given to engaging interns or pre-service learners as key informants. Positioned at the nexus between academia and the workplace, this group offers valuable insights: they possess firsthand experience of professional communication while maintaining an awareness of learner needs and preferences. Their adaptability to emerging technologies and willingness to collaborate with educators further enhance their potential contribution to TBNA data collection. Including interns' perspectives could bridge the gap between educational objectives and workplace realities, enriching the validity and relevance of TBNA findings.

In addition, while TBNA emphasizes authentic language tasks more than traditional introspective NA approaches, technological advancements continue to reshape its methodologies. In particular, AI tools hold significant potential to augment TBNA processes by generating sample dialogues, serving as supplementary data sources, and streamlining data analysis. Future research should explore how AI can enhance the efficiency and scalability of TBNA without compromising empirical rigor, thereby expanding its applicability across diverse educational contexts.

C. Limitations in TBNA

Despite its potential to provide rich, authentic data for course design, the complex and labor-intensive nature of TBNA often discourages researchers and practitioners from fully engaging with it (Hillman & Long, 2020; Phuong, 2023). Conducting TBNA typically requires multi-stage data collection, such as task identification, sequencing, and analysis, through diverse methods like interviews, questionnaires, and onsite observations. These processes are time-consuming, resource-intensive, and methodologically demanding, especially when compared to more straightforward introspective NA approaches (Serafini et al., 2015). However, such an investment of effort is worthwhile, as TBNA provides empirically grounded insights into workplace communication that can significantly enhance the relevance and effectiveness of LSP course design (Long, 2005; Serafini & Torres, 2015). The challenge lies in making TBNA more accessible and manageable without compromising its rigor.

To address these methodological challenges, emerging AI technologies offer promising solutions for enhancing TBNA processes. Tools such as ChatGPT have demonstrated capabilities in generating task samples, assisting with questionnaire design, and automating transcription and coding, thereby reducing the workload and complexity inherent in traditional TBNA practices (Buckley, 2024; Baidoo-Anu & Owusu Ansah, 2023). By automating these procedural components, AI can encourage broader adoption of TBNA among educators and researchers, particularly those lacking access to technical support or large research teams. This suggests a future direction in which AI complements—rather than replaces—human-centered TBNA practices, enhancing their scalability and adaptability across diverse contexts while preserving methodological rigor.

Nevertheless, the integration of AI into TBNA requires careful oversight. Without proper triangulation and contextual validation, AI-generated data may suffer from overgeneralization or cultural insensitivity, limiting its pedagogical relevance (Kostikova et al., 2024; Baidoo-Anu & Owusu Ansah, 2023). Moreover, over-reliance on automation risks undermining the empirical depth that defines TBNA methodology (Onesi-Ozigagun et al., 2024). Future research should further explore responsible approaches for integrating AI into TBNA, ensuring that technological support enhances, rather than compromises, the integrity of the process. The framework in Fig. 4 illustrates the potential role of AI within the TBNA implementation cycle.

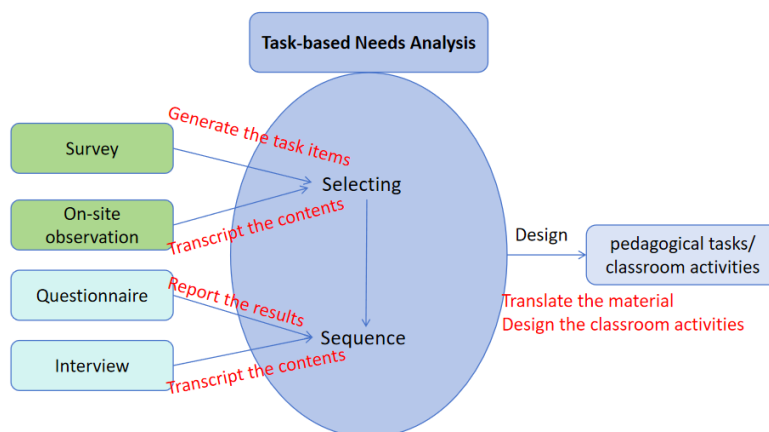


Figure 4. The AI-Assist (Red Part) Framework of Task-Based Needs Analysis

VI. CONCLUSION

This review synthesized 26 empirical studies on Task-Based Needs Analysis (TBNA) in L2 course design for specialized contexts. The findings reveal growing interest in TBNA across diverse professional fields, with most studies following Long's (2005) framework and emphasizing triangulated data sources and mixed-method designs. Common research goals included task identification, sequencing, and syllabus design, often grounded in authentic workplace communication needs. Despite the big progress it has already made, the review noticed persistent methodological challenges within TBNA research, such as limited onsite observation, lack of validated tools, and the labor-intensive nature of data analysis. These issues underscore the need for more efficient and standardized TBNA procedures.

While this review focused on mapping current trends and practices, future research may explore the integration of AI as a complementary tool to address some of these methodological constraints. AI-powered tools, such as ChatGPT or automated transcription and analysis software, may assist in generating task lists, designing surveys, analyzing large datasets, and organizing authentic communication samples. However, these technologies should be used with caution and in conjunction with triangulated data to ensure validity, contextual relevance, and pedagogical alignment.

However, this review has certain limitations. It primarily focused on workplace-oriented TBNA studies, excluding those situated within academic English for Academic Purposes (EAP) contexts. Additionally, theoretical articles without empirical data were not included, which may limit the scope and generalizability of the findings across broader educational settings. By outlining the current trends, methodological foundations, and persistent challenges of TBNA, this review provides researchers and practitioners with a comprehensive reference point. It also offers a starting framework for enhancing TBNA practice through responsible innovation, paving the way for more effective and empirically grounded LSP course design.

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