

Vol. 15, No. 1
pp. 119-143
March &
April 2024

Received: 24 July 2022
Received in revised form: 2 September 2022
Accepted: 12 September 2022

A Methodological Synthesis of Research Articles in the *English for Specific Purposes*'s Lifespan

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Abstract

This research synthesized the methodological issues of studies published in *English for Specific Purposes* from its debut in 1980 up to 2020, from both an overall perspective and also periodically in four decades. To this aim, we examined 617 empirical articles with regard to two themes: (a) research methodology, and (b) data sources. More specifically, we probed into the methodological designs, how they were integrated and the points of departure in qualitative research. Our results brought to the fore that the majority of ESP articles were framed as combined methods studies, most frequently concurrent designs, dominated by qualitative data and data collection. As well, about half of qualitative studies did not specify their approach and the majority of quantitative works utilized descriptive statistics and combinations of different tests. Pertaining to data sources, text samples as well as an amalgamation of different data collection techniques were the most prominent ones. Based on these results and discussion, we provided empirically-grounded recommendations and suggestions for promoting methodological transparency and rigor for the prospective studies for the field of ESP and applied linguistics in general.

Keywords: ESP, ESP empirical articles, ESP research methodology, ESP data sources, English for specific purposes

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1. Introduction

The ESP journal, known as *ESPj*, was founded in 1980 by Grace Mancill from the English Language Institute at the American University in Washington, D.C. Over its 44-year existence, *ESPj*, as the first specialist scholarly journal in the field, has become recognized as a leading international journal in the area of English for Specific Purposes (ESP). As Hyland (2022) pointed out, it is considered a flagship journal within the ESP community and has the highest readership, relevance, and impact. It can be argued that *ESPj* has been driving research in ESP (Master, 2005), publishing articles on diverse topics related to discourse analysis to teaching and learning for specific communities, such as academic, vocational, and specialized contexts. The journal also encourages research on various areas like language testing and assessment, curriculum development, and evaluation as long as it relates to ESP.

As shown on the website of the *ESPj*, this journal had an impact factor of 2.8 in 2020. The impact factor of *ESPj* has illustrated a 5-year increasing trajectory, with its rank being 23 among approximately 200 scholarly publications in the category of Linguistics and Language in Journal Citation Report ranking. As Hyland (2022) pointed out, this wide readership is a plus point for the field given that the journal has provided scholars with insights and ideas from a wide range of disciplines and occupations, thereby contributing to a coherent approach to language pedagogy. What is more, *ESPj*'s impact factor was 3.39 in 2020 and it has been continuing to rise. Additionally, h-index (i.e., productivity and citation impact of the journal) of *ESPj* is 72, highlighting the prestige and impact of the journal in the field.

As it was argued by Swales (1988), a historical and narrative account would be a useful way for shedding light on the evolution of a scholarly journal. In fact, one of the fundamental contributions of such reviews to the field is that their results portray a clearer picture of key journals foci and interests as well as the priorities and agendas of a typical community, for example ESP, over different time periods and overall. In the main, as it has been shown above, considering the burgeoning popularity and leadership of *ESPj* in the field and its more than 45 years of publication, it is timely and useful to conduct a research synthesis on its articles from a methodological standpoint. Given that the journal has been published for about half of a century, the current review has encompassed a wide time span, deemed as one the most comprehensive systematic review targeting *ESPj* and

ESP. This methodological review, hence, would cast light on ESP research trajectory across four time periods which is not only useful for different ESP stakeholders in promoting the methodological rigor and transparency of their studies, but also it would establish a groundwork for novice ESP researchers in their future studies so as they can make sound methodological decisions.

This study can be viewed as a “meta-disciplinary inquiry,” or “historical inquiry” (Matsuda, 2005, p. 71) having examined historical developments of a wide range of themes in ESP as an interdisciplinary area (see for example Khazaie & Ketabi, 2023). It can also be considered a “narrative inquiry” (Casanave, 2005) as we sought to shed light on ESP research trajectory in order to be able to tell the story of ESP research developments from within, as manifested in *ESPj*. The literature review in the next section will provide a brief historical picture about ESP, ESP research and related research syntheses conducted pertaining to ESP.

2. Review of the Related Literature

2.1. ESP Historical Trajectory and Developments

As Howatt and Richard (2014) pointed out, in contrast to other ELT areas (e.g., instructional second language acquisition), the history of ESP teaching is not easy to trace since merely a modicum of it are courses and publications. Taking a look at the early years of ESP, one can see that communication across different languages and within different professions and disciplines were the most researched areas (Benesch, 2001; Johns, 2013; Starfield, 2013). As we moved forward in the historical trajectory of ESP, as Blecher (2009) also listed, several other areas like English for academic purposes (EAP), English for occupational purposes (EOP) and English for vocational purposes (EVP) emerged. It should be mentioned here that, since 1960s, using English for specific purposes has always been an important concern in ELT, a fact which has also been echoed by Johns (2013) as well as Swales (2020). Thus, it is held that ESP “moved from periphery of applied linguistics to a serious force on the world stage” (Hyland & Jiang, 2021b, p.13). Another recent observation which can attest the significance of ESP and its identity as an independent field is the debut of several other scholarly and prestigious journals like *Journal of English for Academic Purposes (JEAP)*, *The Asian ESP Journal*, *English for Specific Purposes World (ESP World)*, and *ESP Today*, all concerned with ESP research and practice.

It is evident in ESP literature that the most important agenda in ESP is “identifying the target situation and then careful analysis of the linguistic features of that situation” (Hutchinson & Waters, 1987, p. 12) of interest to the ESP community (see for example Ayuningtyas, et al., 2022). According to Basturkmen (2010), English for Specific Purposes (ESP) holds great importance in various domains, including academic, professional, and occupational contexts. Within these broad areas of ESP, there are other even more specific branches like English for Specific Academic Purposes as posited by (Basturkmen, 2010).

2.2. Research Syntheses in ESP

In each field, it is fruitful and even necessary to review and take an analytic look at knowledge and evidence presented in the previous studies which investigated the same area or domain (Norris & Ortega, 2007). This synthesizing the previous research, which is considered systematic reviews under the umbrella term of the secondary research (for a classification of this type of see Chong & Plonsky, 2023 research), can prepare the ground for the interactions between different domains and sub-domains in AL, providing a clear and multidimensional picture about what has been done and what has not (e.g., gaps and inconsistencies in methodology of the reviewed studies) (Norris & Ortega, 2006).

Research syntheses, with a rising trend in AL (Norris & Ortega, 2007), have been quantitative in nature including bibliometric and scientometric studies (e.g., Hyland & Jiang, 2021a; Hyland & Jiang, 2021b; Liu & Hu, 2021) or sometimes qualitative in the form of narrative and/or systematic reviews (e.g., Canagarajah, 2016; Ghanbar & Rezvani, 2023a; Ghanbar & Rezvani, 2023b; Gollin-Kies, 2014; Riazi, Ghanbar et al., 2023; Riazi, Rezvani et al., 2023; Riazi et al., 2018; Riazi et al., 2020, Slomp, 2019; Stapleton & Shao, 2018). Intriguingly, there are other research syntheses in which authors reviewed publications from different journals to throw light on similarities and differences in a wide variety of themes, from research foci to data collection techniques, and research methodologies (see for example, Gao, Li, & Lu, 2001; Gollins-Kies, 2014; Liu & Hu 2021). What is more, there are other syntheses with a focus exclusively on a particular journal, elucidating different trends in the published articles (e.g., authorship, methodology, theoretical orientations) within the same journal (e.g., Riazi, Ghanbar et al., 2023; Hewings, 2002; Riazi et al., 2018; Slomp, 2019; Swales & Leeder, 2012).

As regards ESP, we have witnessed several research reviews, aiming to track historical developments and significant focuses and agendas over different time periods and along different developmental stages of the field. These studies have typically been conducted by key scholars in the field based on their insights and visions gleaned from decades of work in the field (e.g., Belcher, 2009; Dudley–Evans & St John, 1998; Hutchinson & Waters, 1987; Paltridge & Starfield, 2011; Swales, 1985, 2019). A case in point is Basturkmen (2021) which investigated ESP research trajectories in a 20–year period. It looked at researched topics and highlighted gaps needed to be addressed in prospective ESP studies. Along with these narrative reviews, there have also been a few systematic reviews targeting research articles in top–tier EAP and ESP journals (e.g., Riazi et al., 2020; Cheng, 2019; Gollin–Kies, 2014; Hewings, 2002; Hyland & Jiang, 2021a & 2021b; Johns, 2013; Liu & Hu 2021; Master, 2005; Swales & Leeder, 2012).

As an example, for the anniversary for *ESPj*, Hewings (2002), conducted a bibliometric study on studies published in the journal to track the changes in publication trends across four time periods, aiming to sketch a picture of future research avenues in the journal. The study reported an increase in articles focusing on EAP rather than on EOP. This study also traced the geographical locations, research focuses as well as the related literature expounded upon in the reviewed studies.

From a methodological perspective, Gollin–Kies (2014), also examined dominant research orientations in *JEAP* and *ESPj* in the time span of 2003 to 2012. This study revealed that qualitative research dominated the publications, and a majority of them opted for written discourse analysis approached mainly qualitatively. The author, hence, recommended conducting more quantitative studies in the field. This study covered a rather limited time period, necessitating conducting more comprehensive studies with a wider temporal scope so that more definitive claims can be made in this regard. In tandem with Riazi et al. (2018), Riazi et al. (2020), implemented a systematic review of 416 empirical articles published in *JEAP*. This study comprised more research themes than other reviews. The themes included gender, communication skills, research methodologies and data sources, with each theme having its own sub–themes.

In another study using bibliometric techniques, Liu and Hu (2021) conducted a co–citation analysis of published works in *ESPj* and *JEAP* in a 28–year time span. More specifically, this study pinpointed key research areas in three different time

spans. They presented their results in terms of eleven clusters, depicting different research focuses in the field. Likewise, Hyland and Jiang (2021a) in a bibliometric analysis examined research trends in EAP research articles published in 40 journals indexed in Social Science Citation Index (SSCI) in the time span of 40 years. This study, in essence, depicted the most recurrent research topics, the most cited articles, authors and geographical locations. They indicated that teaching, learning and classroom practices were among the most recurrently investigated topics. As well, they reported that the patterns of top-cited authors and scholarly works. The study also pointed to an inclination of the field towards social interaction and academic literacy. In a similar study, Hyland and Jiang (2021b) conducted another bibliometric study to investigate the patterns of change in articles in the field of ESP published in SSCI journals in a 30-year time period. This time, again, through bibliometric techniques, they identified the dominant research foci as well as highly cited articles, journals, scholars, and nations. Their results revealed that analyzing written texts in different disciplines and occupations as well as examining classroom practices were the most predominant research foci in ESP articles.

Considering what the previous studies focused on and in order to continue this research avenue, our study seeks to offer a meta-disciplinary and systematic review of research on ESP by examining the empirical articles (hereafter EAs) published in *ESPj* in its lifecycle. Given that the majority of reviewed studies were bibliometric and have not portrayed an analytic picture of research methodology, our study aims to address this gap by a review and analysis of methodological orientations and data collection instruments utilized in EAs published in *ESPj* in its lifecycle. We hope that by investigating the methodology of EAs from a wide range of perspectives in the wide time span of four decades of *ESPj*, we can shed light on methodological choices and decisions of ESP researchers in different time periods in ESP research. The results of this review are hoped to promote the methodological rigor and transparency of future ESP studies by representing the status-quo of ESP research as represented by the *ESPj* publications. In the next section, we will provide accounts of corpus compilation and the development of coding scheme as well as coding and analysis of EAs.

3. Methodology

3.1. Corpus and Corpus Compilation

The initial pool of articles encompassed 1465 files directly downloaded from the website of *ESPj*. This pool included a wide variety of publication types like editorials, announcements, book reviews, short communications, discussions and research notes and full-length research articles published in *ESPj* over 40 years. These files were screened, and, subsequently, they were grouped into two folders: (a) full-length research articles ($n = 764$) and (b) others ($n = 701$). Following this, we read through the abstracts and methodology sections of research articles and then we removed from the pool those studies which were not empirical (i.e., primary-led articles) ($n = 147$). These articles were critical reviews, historical reviews, research syntheses, state-of-the-art articles, bibliometric studies.

Having cleaned our pool, we ended up having 617 EAs (quantitative, qualitative, or mixed-methods) which spanned four decades of publication in the journal and covered all the volumes up to the end of volume 60, October 2020 (1980 to 2020). It should be noted that the final corpus did not include any studies involving no participants and secondary data and data analysis (e.g., corpus based studies).

3.2. Coding and Coding Procedures

We were informed by several other reviews like Riazi et al. (2020), Gollin-Kies (2014) and Riazi et al. (2018) in designing and developing our coding scheme. Moreover, research gaps identified above, that is, the paucity of a comprehensive and systematic methodological synthesis in ESP motivated us to probe into different issues pertaining to research methodology and data sources in our coding scheme.

The coding stage of this study lasted for 8 months. Prior to coding, we first created an annotated summary file of all 617 EAs. This Excel file encompassed a wide range of pieces of information like details of author(s), publication years, titles, volumes, and issue numbers. After gleaning such data, we coded the studies on the basis of the themes and the sub-themes of interest.

More specifically, regarding research methodology, the coding scheme included: a) purely quantitative, b) purely qualitative, c) combined methods, and

d) Mixed-method research (MR). Regarding quantitative studies, we examined quantitative techniques used in them; vis-à-vis qualitative studies we specified qualitative approaches as well as points of departure of studies based on Benson et al. (2009) and Harklau (2011). They identified two broad-based points of departure in qualitative methodologies as employed in language learning and teaching. The first point of departure is the analyses of “the people, situations, and social processes” (Benson et al., 2009, p. 84) or “sociocultural and ecological contexts of language learning and teaching” (Harklau, 2011, p. 178). The second entails “the construction of social realities through discourse” (Harklau, 2011, p. 178) or examining “spoken and written texts” (Benson et al., 2009, p. 84).

As regards MMR studies, in addition to drawing on MMR’s taxonomy proposed by Riazi and Candlin (2014) as well as Riazi (2016), we also considered five main patterns of mixing qualitative and quantitative methodologies propounded by Greene et al. (1989). These are triangulation, complementarity, development, initiation, and expansion. Thus, our criterion for classifying articles into “combined methods” MMR category is based on the MMR literature and particularly Greene et al.’s (1989) classification. Specifically, where we found researchers making explicit references to MMR literature and identifying a clear purpose for using and mixing methodologies and data analytic techniques, we coded them as MMR and where there was no reference to MMR literature, nor did they explicitly state a purpose for using and mixing two methodologies, we coded them as a mere combination of methods. Furthermore, we adopted Johnson and Christensen’s (2012) “2 (equal status vs. dominant status) by 2 (concurrent vs. sequential) matrix”, as cited in Riazi (2016, p. 37), which included “four cells” for further specification of “combined methods” studies.

In order to code data collection methods (i.e., sources of data) in EAs, Hyland’s (2016b, p. 117) classification was utilized, encompassing “elicitation,” “introspection,” “observation,” and “text samples” as follows:

- “Elicitation” (e.g., “questionnaire”, “interviews”, and “tests”)
- “Introspection” (e.g., “think-aloud protocols”, “retrospective reports”, and “diaries”)
- “Observation” (e.g., audio- and/or video-recordings of interactions)
- “Text samples” (e.g., writing samples, or corpora).

We also designated another code, termed as “multiple”, when two or more data sources were utilized in conjunction (e.g., interviews and text samples or observation and introspection). The last coding category was “pedagogical implications (hereafter PIs)”, where articles were coded with regard to whether they offered any PIs, and if so, whether of limited or extended length, explicit or implicit, and irrespective of whether or not there was an explicit heading. We designated PIs exceeding 125 words as the maximum paragraph length in technical writing (Covey, 2012) as extended and those with fewer words led us to code them as short.

In addition to throwing light on the overall patterns, we also examined themes across four-time spans of 1980–1989 ($n = 49$), 1990–1999 ($n = 114$ articles), 2000–2009 ($n = 187$ articles), and 2010–2020 ($n = 267$ articles). The logic behind considering two types of temporal analysis is to capture a clearer picture of trajectories of changes over time in methodological choices and decisions of ESP researchers. In regard to the inter-coder agreement, prior to the main coding stage, we first randomly selected 25 EAs and then we coded them independently. In this phase, among the aggregate of 81 coded cells, we observed disagreements merely in five cells (less than 1%). After the initial coding stage, we discussed the challenges and minor inconsistencies in two online meetings and came into terms with each other. Having refined our coding scheme, in the second phase of checking the inter-coder reliability, we randomly selected 62 EAs (approximately 10% of the total EAs) and coded them. In this stage, our inter-coder reliability was 0.94 (Cohen’s kappa) which was considered decent. Having obtained a satisfying inter-coder reliability index, we started the main coding stage.

4. Results

Methodological orientations used in the lifespan of *ESPj*’s articles are shown in Table 1. Overall, combined methods is the predominant methodology (55.8%, $n = 344$), followed by qualitative (30.5%, $n = 188$), quantitative (12.3%, $n = 76$), and MMR (1.4%, $n = 9$). Periodically, despite the fact that qualitative methodology was the most dominant in the first (46.9%, $n = 23$) and the second period (45.6%, $n = 52$), in the third period, with a substantial increase, combined methods became the most frequent methodology in *ESPj*’s articles (61%, $n = 114$) followed by qualitative (33.1%, $n = 62$) and quantitative (5.9%, $n = 11$) methodologies. The

trend witnessed in the third period was also seen in the last period in that, again, combined methods far outnumbered others (61.8%, $n = 165$) with a very slight growth. Interestingly, in this period, there was a sharp decrease in qualitative orientation (19.1%, $n = 51$) as compared with the previous period (33.1%, $n = 62$). In reverse, quantitative methodology was observed to rise steeply in this period (15.7%, $n = 42$) in comparison with the last period (5.9%, $n = 11$), although this methodology was still the third most recurrently utilized one in this period after qualitative orientation. Of note in the most recent period was the debut of MMR, with only nine articles (3.4%) having been framed in this methodology. We also further investigated MMR in terms of their purpose of mixing (i.e., triangulation, complementarity, development, initiation, and expansion). We found that out of nine MMR studies in our sample, six (e.g., Staples, Kang, & Wittner, 2014; Bancroft–Billings, 2020) were of complementary, one of expansion (Arnó–Macià et al., 2020) and two of triangulation (e.g., Caplan & Stevens, 2017) types.

Table 1*Methodological Orientation Patterns across Different Periods and Overall*

Research Methods	1980-1989	1990-1999	2000-2009	2010-2020	Total
Combined methods	16 (32.7%)	49 (43.0%)	114 (61.0%)	165 (61.8%)	344 (55.8%)
Qualitative	23 (46.9%)	52 (45.6%)	62 (33.1%)	51 (19.1%)	188 (30.5%)
Quantitative	10 (20.4%)	13 (11.4%)	11 (5.9%)	42 (15.7%)	76 (12.3%)
MMR	0 (0%)	0 (0%)	0 (0%)	9 (3.4%)	9 (1.4%)
Total	49 (100%)	114 (100%)	187 (100%)	267 (100%)	617 (100%)

As the most recurrent methodology in *ESPj*'s lifespan, combined methodology is worthy of further scrutiny. As displayed in Table 1, the overwhelming majority of combined methods studies (99.1%, $n = 341$) involved concurrent triangulations which has been the dominant combining pattern across all periods. In contrast, just three studies overall exploited sequential combined methods with an expansion purpose in which the results of the earlier stages of the research contributed to the design of the next stages (see Greene et al. 1989; Riazi, 2016).

More specifically, as regards the emphasis and weight of the methodological orientations in combined methods, it was revealed that a big share were studies with a dominantly qualitative design (e.g., Tadros, 1989; Bruce, 2009) which, except for the first (43.7%, $n = 7$) and the second (28.6%, $n = 14$) periods, was a consistent trend across the two most recent time spans and overall (46.5%, $n=160$).

Balanced use of qualitative and quantitative orientations was found to be the second most dominant type of combined methods studies (e.g., Min, 2008; Li, 2019). Periodically, these studies were the most predominant ones in the first (50%, $n = 8$) and the second (42.8%, $n = 21$) periods, notwithstanding the fact they became the second most recurrent pattern of combining methods in the third (26.3%, $n = 30$) and the most recent period (28.5%, $n = 47$). These patterns of combination, and, also, the less frequent dominance of quantitative orientation in combined methods indicate, in general, the more complementary intention in the use of quantitative methods in *ESPj*. Worthy of attention also is the finding that all the three sequential (signified by arrows) combined methods studies were implemented in the last time period, with two being dominantly qualitative (e.g. Wette, 2019) and one involving a balanced utilization of both methods (see Kim et al., 2018). It should also be stated that no other sequences were identified in our sample.

Table 2*A Breakdown of Combining Methods Studies Periodically and Overall*

Orientation	1980-1989	1990-1999	2000-2009	2010-2020	Total
QUAL+ quan ^a	7 (43.7%)	14 (28.6%)	56 (49.1%)	83 (50.3%)	160 (46.5%)
QUAL+ QUAN ^b	8 (50%)	21 (42.8%)	30 (26.3%)	47 (28.5%)	106 (30.8%)
QUAN+ qual ^c	1 (6.3%)	14 (28.6%)	28 (24.6%)	32 (19.4%)	75 (21.8%)
QUAL→quan ^d	0 (0%)	0 (0%)	0 (0%)	2 (1.2%)	2 (0.6%)
QUAL→QUAN ^e	0 (0%)	0 (0%)	0 (0%)	1 (0.6%)	1 (0.3%)
Total	16 (100%)	49 (100%)	114 (100%)	165 (100%)	344 (100%)

Note. ^aConcurrent with a qualitatively dominant design. ^bConcurrent quantitative qualitative data and analysis in a balanced manner. ^cConcurrent with a quantitatively dominant design. ^dSequential with a qualitatively dominant design. ^eSequential balanced utilization of quantitative and qualitative data and analysis.

As qualitative research methodology is the second most dominant methodology in *ESPj*'s articles, it is worthwhile and also informative to examine, both overall and periodically, points of departure and approaches of pure qualitative studies. As can be seen in Table 3, intriguingly, *ESPj*'s qualitative articles were equally distributed across the two points of departure with a few of them (6.4%, $n = 12$) framed with both points of departure at the same time. Periodically, notwithstanding the fact that the second point of departure was marginally the most predominant one in the first three periods, in the most recent period the first point of departure was found to be dominant (47.1%, $n = 24$) as the first one

experienced a sharp fall (31.4%, $n = 16$). It should be mentioned that the incorporation of both points of departure, which was very scarce in *ESPj*'s lifespan, was witnessed as a vogue in this time span, with 11 out of 12 of this type of studies having been designed in such a way in this time period.

Table 3*Qualitative Points of Departure Periodically and Overall*

Points of Departure	1980-1989	1990-1999	2000-2009	2010-2020	Total
Point of Departure 1	10 (43.5)	24 (46.2%)	30 (48.4%)	24 (47.1%)	88 (46.8%)
Point of Departure 2	12 (52.2)	28 (53.8%)	32 (51.6%)	16 (31.4%)	88 (46.8%)
Both	1 (4.3%)	0 (0%)	0 (0%)	11 (21.6%)	12 (6.4%)
Total	23 (100%)	52 (100%)	62 (100%)	51 (100%)	188 (100%)

Note: Based on Benson et al., 2009; Harklau, 2011 the first point of departure is the analyses of "sociocultural and ecological contexts of language learning and teaching" (Harklau, 2011, p. 178) or "the people, situations, and social processes involved in language learning and teaching". The second point of departure is "spoken and written texts" (Benson et al., 2009, p. 84), or "the construction of social realities through discourse" (Harklau, 2011, p. 178).

We also clarified the qualitative approaches ESP researchers utilized in purely qualitative articles. As presented in Table 4, in around half of the studies (48.9%, $n = 92$) in total, and, across the periods, ESP researchers did not provide adequate information to pin down the specific qualitative approach utilized. In the other half, overall, case study (18.3%, $n = 26$) was the most pervasive qualitative approach in *ESPj*'s articles, which, except for the second period (9.6%, $n = 5$), was a consistent trend in other periods. Genre analysis, was the second most dominant qualitative approach (12.8%, $n = 24$) in the main and periodically, apart from the second time period, in which it was the most frequent qualitative approach (17.3%, $n = 9$). There were also less frequently utilized qualitative approaches, such as discourse analysis (DA) (3.7%, $n = 7$), ethnography (3.7%, $n = 7$) and systemic functional linguistics (SFL) (2.7%, $n = 5$). Across the periods, DA showed a decline in the last three periods (7.7%, $n = 4$; 3.2%, $n = 2$; and 2%, $n = 1$, respectively). Pertaining to ethnography, despite its marginal popularity in the first (8.7%, $n = 2$) and second periods (7.7%, $n = 4$), it experienced a dip in the third (0%) and recent (2%, $n = 1$). SFL, with its debut being in the second period (1.9%, $n = 1$), also followed a consistent trend in the two most recent periods (3.2%, $n = 2$; and 3.9%, $n = 2$ respectively). Of note in Table 7 is the increasing popularity of using several qualitative approaches in tandem with studies in the

two most recent periods (9.8%, $n = 6$; and 13.5%, $n = 7$, respectively) which was in a marked contrast with its paucity in the first two periods.

Table 4
Qualitative Approaches across the Four Periods and Overall

Qualitative Approaches	1980-1989	1990-1999	2000-2009	2010-2020	Total
Not mentioned	15 (65.3%)	26 (50.1%)	28 (45.2%)	23 (45.1%)	92 (48.9%)
Case study	4 (17.4%)	5 (9.6%)	11 (17.7%)	6 (11.8%)	26 (18.3%)
Genre analysis	0 (0%)	9 (17.3%)	10 (16.1%)	5 (9.8%)	24 (12.8%)
DA	0 (0%)	4 (7.7%)	2 (3.2%)	1 (2%)	7 (3.7%)
Ethnography	2 (8.7%)	4 (7.7%)	0 (0%)	1 (2%)	7 (3.7%)
SFL	0 (0%)	1 (1.9%)	2 (3.2%)	2 (3.9%)	5 (2.7%)
GA	0 (0%)	1 (1.9%)	2 (3.2%)	1 (2%)	4 (2.1%)
Text analysis	0 (0%)	0 (0%)	1 (1.6%)	2 (3.9%)	3 (1.6%)
CA	1 (4.3%)	0 (0%)	0 (0%)	1 (2%)	2 (1.1%)
Action research	0 (0%)	1 (1.9%)	0 (0%)	1 (2%)	2 (1.1%)
Corpus analysis	0 (0%)	1 (1.9%)	0 (0%)	0 (0%)	1 (0.5%)
Narrative inquiry	0 (0%)	0 (0%)	0 (0%)	1 (2%)	1 (0.5%)
A Combination	1 (4.3%)	0 (0%)	6 (9.8%)	7 (13.5%)	14 (7.5%)
Total	23 (100%)	52 (100%)	62 (100%)	51 (100%)	188 (100%)

Analogously, Table 5 provides detailed information on quantitative practices of ESP researchers in pure quantitative articles of *ESPj* over its lifespan. As can be seen, overall, during the four time periods, simple descriptives (DS) (e.g., frequency, percentage, measures of central tendency, and variance) was the most dominant practice (34.2%, $n = 26$), followed by a combination of different statistical tests (27.6%, $n = 21$) (e.g., t -test and Chi-square; Pearson correlation and multiple regression; Mann-Whitney U test; Friedman test) and DS together with a statistical test (18.6%, $n = 14$) (e.g., descriptives and Pearson correlation; descriptives and one-way analysis of variance [ANOVA]; descriptives and Log-Likelihood statistic [LL]). Over periods, simple DS was the most frequent technique in the first period (70%, $n = 7$), although in the second period both simple DS and a combination of different tests (e.g., t -tests, Chi-square, and ANOVA; t -test and Chi-square; t -test and ANOVA) as well as DS with a statistical test (e.g., descriptives and Pearson correlation) were the most recurrent ones. Interestingly, in this period, we observed the appearance of Pearson correlation, multiple regression and factor analysis for the first time in *ESPj*. In the third period, the pattern of using quantitative techniques was roughly the same as that in the second period except that ESP researchers did not use DS in conjunction with statistical tests and, instead, exploited independent-samples t -

test (9.1%, $n = 1$) and one-way ANOVA (9.1%, $n = 1$), with Chi-square (27.3%, $n = 3$), simple DS (27.3%, $n = 3$) and a combination of different statistical tests (27.3%, $n = 3$) being the most frequent quantitative techniques. In the last period, the most frequently used quantitative technique was an amalgam of different tests (35.6%, $n = 15$) followed by mere DS (31%, $n = 13$) and a combination of DS and another statistical test which was soring to 26.2% ($n = 11$) as compared with its no use in the former period.

Table 5*Quantitative Practices across the Four Periods and Overall*

Quantitative Technique	1980-1989	1990-1999	2000-2009	2010-2020	Total
Simple descriptives	7 (70%)	3 (23.1%)	3 (27.3%)	13 (31%)	26 (34.2%)
Combination of different statistical tests	0 (0%)	3 (23.1%)	3 (27.3%)	15 (35.6%)	21 (27.6%)
Simple descriptives and a statistical test	0 (0%)	3 (23.1%)	0 (0%)	11 (26.2%)	14 (18.6%)
ANOVA	1 (10%)	1 (7.7%)	1 (9.1%)	1 (2.4%)	4 (5.3%)
<i>t</i> -tests	1 (10%)	0 (0%)	1 (9.1%)	1 (2.4%)	3 (3.9%)
Chi-square	0 (0%)	0 (0%)	3 (27.3%)	0 (0%)	3 (3.9%)
MANOVA	1 (10%)	0 (0%)	0 (0%)	1 (2.4%)	2 (2.6%)
Pearson Correlation	0 (0%)	1 (7.7%)	0 (0%)	0 (0%)	1 (1.3%)
Multiple regression	0 (0%)	1 (7.7%)	0 (0%)	0 (0%)	1 (1.3%)
Factor analysis	0 (0%)	1 (7.7%)	0 (0%)	0 (0%)	1 (1.3%)
Total	10 (100%)	13 (100%)	11 (100%)	42 (100%)	76 (100%)

In addition to the findings above, we further sought to cast more light on quantitative practices in those 344 combined methods articles. As it was shown in Table 6, the overall pattern had a bare resemblance to what we came up with in pure quantitative studies. In fact, simple DS permeated in the articles overall (76.3%, $n = 263$) and across four periods. Nonetheless, after DS, we observed that Chi-square dominated EAs overall (7.8%, $n = 27$) and across periods, except in the fourth period wherein *t*-test (6.1%, $n = 10$) and simple DS in conjunction with a statistical test (6.1%, $n = 10$) were also equally predominant. Another noteworthy finding is a drop we saw in the usage of a combination of different statistical tests here in combined methods studies (2.9%, $n = 10$), although an increasing pattern in their use over periods, from no use in the first period to eight uses in the last period, is also discernible, representing a rise of statistical complexity in EAs. Of note is the use of new statistical tests like Log-Likelihood, Keyness analysis and cluster analysis in combined methods articles, which have emerged from the third period, with a foreseeable burgeoning of Log-Likelihood.

Table 6*Quantitative Practices across the Four Periods and Overall in Combined Methods Studies*

Quantitative Technique	1980-1989	1990-1999	2000-2009	2010-2020	Total
Simple descriptives	13(82%)	36 (73.4%)	97 (85%)	117 (70.9%)	263(76.3%)
Chi-square	1 (6%)	9 (18.5%)	7 (6.1%)	10 (6.1%)	27 (7.8%)
t-tests	0 (0%)	2 (4.1%)	4 (3.5%)	10 (6.1%)	16 (4.7%)
Simple descriptives and a statistical test	0 (0%)	1 (2%)	2 (1.8%)	10 (6.1%)	13 (3.8%)
Combination of different statistical tests	0 (0%)	0 (0%)	2 (1.8%)	8 (4.8%)	10 (2.9%)
ANOVA	1 (6%)	0 (0%)	1 (0.9%)	3 (1.8%)	5 (1.5%)
Log-Likelihood	0 (0%)	0 (0%)	0 (0%)	5 (3%)	5 (1.5%)
Pearson Correlation	1 (6%)	1 (2%)	0 (0%)	0 (0%)	2 (0.6%)
Factor analysis	0 (0%)	0 (0%)	0 (0%)	1 (0.6%)	1(0.3%)
Cluster analysis	0 (0%)	0 (0%)	1 (0.9%)	0 (0%)	1(0.3%)
Keyness analysis	0 (0%)	0 (0%)	0 (0%)	1 (0.6%)	1(0.3%)
MANOVA	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Multiple regression	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	16 (100%)	49 (100%)	114 (100%)	42 (100%)	344(100%)

As with data sources used in the studies, the most frequent sources were text samples (45.7%, $n = 282$), multiple data sources (31.4%, $n = 194$) and elicitation (13.9%, $n = 86$) cumulatively accounting for 91% (562 of the total 617) of all the data sources in the *ESPj* corpus analyzed. The other two data sources, that is, observation as well as documents and archival records, all together constituted less than one-tenth (9%) of all data sources. It should be noted that, rather oddly, introspection per se was not utilized in any of the studies. Nevertheless, 16.5% ($n = 32$) of the studies in the multiple category used introspection as one of their multiple means of data collection (see Table 7).

Table 7*Data Sources across the Four Periods and Overall*

Data Sources	1980-1989	1990-1999	2000-2009	2010-2020	Total
Text samples	17 (34.7%)	51 (44.7%)	90 (48.1%)	124 (46.4%)	282 (45.7%)
Multiple	12 (24.5%)	38 (33.3%)	51 (27.3%)	93 (34.8%)	194 (31.4%)
Elicitation	10 (20.4%)	16 (14%)	21 (11.2%)	39 (14.6%)	86 (13.9%)
Observation	10 (20.4%)	7 (6.1%)	24 (12.8%)	5 (1.9%)	46 (7.5%)
Documents*	0 (0%)	2 (1.8%)	1 (0.5%)	6 (2.2%)	9 (1.5%)
Total	49 (100%)	114 (100%)	187 (100%)	267 (100%)	617 (100%)

Note: *Can be documents or other archival reports

As it is depicted in Table 7, across the four time periods, the use of text samples remained consistently prevailing. The most notable increase in the use of

text samples was from the first to the second period, where it rose from 34.7% ($n = 17$) to 44.7% ($n = 51$). The increasing tendency continued in the third period (48.1%, $n = 90$), though it showed a slight decrease in the fourth period (46.4%, $n = 124$). The use of multiple data sources increased from 24.5% ($n = 12$) in the initial decade to 33.3% ($n = 38$) in the next decade, though the proportion somewhat declined in the third period (27.3%, $n = 51$) before increasing again in the last period (34.8%, $n = 93$). As for elicitation, whilst in the first period almost one fifth of studies (20.4%, $n = 10$) exploited elicitation as a data source, its use dropped proportionally in the subsequent three periods (14%, $n = 16$; 11.2%, $n = 21$; 14.6%, $n = 39$, respectively). A similar decreasing pattern was discernible in the case of observation. In the first period, just like elicitation, observation made up almost one fifth of the data sources (20.4%, $n = 10$); nonetheless, its utilization dropped considerably in the second period (6.1%, $n = 7$). Despite an increase in the third period (12.8%, $n = 24$), the use of observation dropped again in the fourth period (1.9%, $n = 5$). Documents and records started being used as a minor data source from the second period (1.8%, $n = 2$) onwards and its minimal use continued in the third and fourth periods (0.5%, $n = 1$ and 2.2%, $n = 6$, respectively).

5. Discussion

Our results revealed that the most dominant methodological orientation was “combined methods” which was in line with the findings of other reviews such as Riazi et al. (2020), but was not in consonance with Gollin–Kies (2014) and Riazi et al. (2018), as they found that qualitative orientation outnumbered other methodologies. The change might be accounted for by ESP researchers’ inclination to broaden and deepen the scope of their studies by amalgamating different methodological orientations (Riazi, 2016; Riazi & Candlin, 2014). We here echo Riazi (2016) and contend that this sole combination is not adequate in combined methods studies as it is just at the level of method, rarely articulating the purposes and rationales behind combining methods in such studies.

We also observed that qualitative methodology ranked the second most frequently exploited methodology, which, again, demonstrated that ESP researchers, in line with other fields such as EAP (Riazi et al., 2020) and second language writing (Pelaez–Morales, 2017; Riazi et al., 2018), opted for this methodology recurrently. Not only field–specific reviews, but also other review

studies (e.g., Benson, 2013; Canagarajah 2016; Richards, 2009) did illustrate that qualitative orientation has been becoming more popular in second language (L2) research. Of note here is that our results revealed that a substantial majority of combined methods studies in our sample also utilized qualitative methodology as their dominant methodological component, suggesting that qualitative orientation was given more weight and attention when it was used in conjunction with the quantitative one. Even so, rather disappointingly, nearly half of the purely qualitative studies in our sample did not provide an adequate account and the rationale for their choice of the qualitative approach. This is also aligned with what Riazi et al. (2020) found in EAP field, Riazi et al., (2023d) in L2 writing research and also the findings of Lew et al., (2018) in different journals in L2 research. After all, qualitative methodology also involves its own pivoting ontological and epistemological underpinnings, influencing the methodological options and decisions made by researchers. Hence, little or inadequate account of the underpinning assumptions and non-transparent descriptions of the methodologies undertaken will eventually have an adverse effect on the interpretation of findings and the all-important trustworthiness in qualitative research (Guba & Lincoln, 1985; Merriam & Grenier, 2019).

Additionally, the preponderance of case studies in qualitative *ESPj*'s articles similarly suggests that the main foci of qualitative studies in it would be "individuals, experiences, issues, insights, developmental pathways, or performance within a particular linguistic, social, or educational context" (Duff, 2014, p. 235), implying the interest of *ESPj* researchers to study more bounded contexts in ESP through pure qualitative approaches. In addition, the utilization of two qualitative points of departure has flourished in the last period, suggesting a small increase in the methodological complexity and rigor of qualitative studies and ESP researchers' cognizance of this methodological option.

Regarding data sources, our findings indicated that the predominant source of data, periodically and overall, was text samples. These findings resonate with those of Riazi et al. (2018) and Zheng and Yu (2019) who likewise mentioned that text samples was the most dominant source of data in their respective studies. It is acknowledged that writing is the most recurrent communication skills in *ESPj* (Lillis & Tuck, 2016) and that there is a tendency in ESP research to use more qualitative approaches to investigate the particular contexts in which a genre is created and used (Hyland, 2016). This might be the underlying reason why texts,

genre analysis and generally qualitative research were opted for frequently in the ESP research we reviewed.

6. Conclusions and Further Directions

Of note, with regard to research methodology, it came to light that ESP researchers tended to combine research methods without clarifying the aim of integrating the two strands and linking it to the literature of MMR methodology. Echoing Riazi (2016), we urge prospective studies to use MMR methodology rather than method, which enables the researchers “to integrate different epistemic perspectives in innovative ways and in the service of a more comprehensive conceptualization of the research problem” (p. 38) framed in more informed and principled MMR design. In principled MMR, ontological and epistemological conceptualizations of the research problem, and not merely design technicalities and research questions, drive a study so that more complex research questions and multidimensional issues could be probed, boosting the methodological rigor of ESP research.

Concerning data sources, our results illustrated the preponderance of text samples and a few uses of elicitation (e.g., interviews or tests) and observation. As instruments like interviews and observation are the main sources of data for the robust and popular qualitative approaches like ethnography, narrative inquiry, and case study, utilizing a variety of data sources is of utmost significance for advancing and enriching qualitative methodology in ESP research. Worthy of note also is the observed scarcity of more sophisticated multivariate analyses such as MANOVA, factor analysis, multiple regression, and structural equation modeling in ESP research although they abound in AL research (see Ghanbar & Rezvani, 2023a). In line with Plonsky and Oswald (2017) we recommend that prospective researchers use more multivariate tests so as to add breadth and depth to their studies. Regarding qualitative studies, as well, our results highlighted the necessity of much more ethnographic studies in *ESPj* and ESP.

It is noted that this review is not without limitations which can be, in a sense, used in a way as ideas for further research. For example, we acknowledge that our analyses and results concerned solely EAs of *ESPj*, the flagship journal of ESP, and not those of other scholarly venues in ESP. In order to complement our study and capture a bigger picture of developmental and research trajectories of ESP we

suggest that prospective studies may conduct a similar review on other ESP journals like *The Asian ESP Journal*, *English for Specific Purposes World (ESP World)*, and *ESP Today* or other types ESP related publications (e.g. dissertations), which may result in uncovering new patterns of results.

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