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Iranian Journal of Language Teaching Research

ORIGINAL ARTICLE

Urmia University

Mixed Methods Research in Applied Linguistics: The Status quo of the Current Issues and Practices

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ABSTRACT

The quality of mixing methods has been widely debated in the field of applied linguistics (AL) and the integration of data from both quantitative and qualitative research paradigms has always been open to controversy. The present study was aimed at recognizing the status quo of MMR in AL, investigating the nature of various sections of MMR studies, and specifying the way the pattern of employing MMR has changed over the past few years. From a total of 1,314 articles in seven peer-reviewed accredited AL journals, 220 articles were finally identified to be mixed in method which were subsequently scrutinized based on already-established frameworks regarding their research questions, research designs, sampling designs, and inference quality to explore the status quo of mixed methods research (MMR) in AL. We went through two phases of screening to identify the articles which met the principles of MMR and analyzed the selected articles qualitatively based on a coding scheme. The findings revealed (a) only a few research questions were hybrid, (b) both concurrent research designs and concurrent sampling designs were employed more frequently than their sequential counterparts, and (c) only a few articles made their inferences mixed in a principled manner. The findings of several extracts and an open-ended questionnaire showed a growing interest in MMR and the challenges and problems of conducting MMR, respectively. The results might imply that the new paradigms of research favor mixing methods and that the researchers employ it more due to its strengths.

Keywords: mixed methods research; inference quality; research question; research design; sampling design

ARTICLE HISTORY

Received: 28 May 2021 **Revised version received:** 25 July 2021

Accepted: 12 Nov. 2021 **Available online:** 1 Jan. 2023

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10.30466/ijltr.2023.121272

Introduction

What Is Mixed Methods Research?

In the integration of quantitative and qualitative approaches, a sheer number of previously-conducted studies has been ignored in other fields like natural sciences or geology because there was no explicit use of the terms related to Mixed Methods Research (MMR) (Maxwell, 2016). However, the genesis of mixing methods is believed to date back to the 1960s when the Mixing Movement was advocated by the researchers in social and behavioral sciences (Collins, Onwuegbuzie, & Jiao, 2007) although some other researchers (e.g., Creswell & Plano Clark, 2018) trace it back to the 1980s. In fact, the criticisms leveled against the dichotomy between quantitative and qualitative methods, to a great extent, paved the way for the emergence of MMR (Greene, 2008; Johnson & Onwuegbuzie, 2004) as a new paradigm or as a combination of the two previously-known paradigms (Ghiara, 2020).

MMR, technically defined as "the collection, analysis, and integration of quantitative and qualitative data in a single or multiphase study" (Hanson et al., 2005, p. 224), has attracted more attention in social and behavioral research recently (Riazi, 2016) and many studies, editorials to journals, and methodological discussions have been devoted to the integration of theoretical and methodological aspects of qualitative and quantitative methods (e.g. Alexander, Eppler, & Comi, 2020; Bazeley, 2018; Creswell, Plano Clark, & Garrett, 2008; Denscombe, 2008; Feilzer, 2010; Fetters & Freshwater, 2015; Fetters & Molina-Azorin, 2017; Greene, 2008; Morgan, 2007; Tashakkori & Teddlie, 2008, to name only a few). In his article, Riazi (2016) maintains that researchers in the field of AL, due to its interdisciplinary nature, are more capable to deal with complicated research problems by employing MMR studies that are "methodologically pluralistic"; a fact which is not feasible if quantitative or qualitative methods are used separately. Although the nature and prevalence of qualitative and quantitative methods have been investigated widely (Benson et al., 2009; Lazaraton, 2003, 2005; Norton, 1995), the integration of the two methods is still in need of much more inquiry (Anderson, 2016; Dörnyei, 2007).

Five purposes have been proposed for MMR by Greene, Caracelli and Graham (1989) regarding its contribution to research design and execution. They include Triangulation, Complementarity, Development, Initiation, and Expansion. Greene et al. (1989) have provided a detailed account of the issue based on examining 57 MMR studies. As maintained by the scholars in the field (e.g., Greene et al., 1989; Riazi & Candlin, 2014), the purpose of triangulation is seeking convergence, corroboration, and correspondence when the results are achieved through using various methods. By using heterogeneous methods, triangulation aims at removing the problems attached to employing only a single research method. When the results obtained from one method are being elaborated, enhanced, illustrated, and clarified by means of using the results obtained from another method, the purpose of mixing methods is said to be complementarity. The logic behind complementarity is to consider each social phenomenon as being multilayered. In this way, different layers of social phenomena can be investigated through utilizing quantitative and qualitative methods (Riazi & Candlin, 2014). There are times when the results of one method are used to assist the results of the other method to be developed or informed. In these cases, the two methods of the given study are employed in sequence and the purpose is development (Riazi & Candlin, 2014). Initiation as another purpose of method mixing "seeks the discovery of paradox and contradiction, new perspectives of frameworks, the recasting of questions or results from one method with questions or results from the other method" (Greene et al., 1989, p. 259). In fact, various perspectives of different methods are initiated to improve the results and interpretations of the analysis when there is a contradiction. The last purpose, expansion, aims at expanding the depth and breadth of investigations by employing the most proper method for diverse components of inquiry.

Furthermore, whether quantitative and qualitative phases of MMR studies are conducted concurrently or sequentially is another distinction in the classifications put forward for mixing methods (Onwuegbuzie & Collins, 2007). In MMR studies designed sequentially, either quantitative or qualitative data are collected and the results are analyzed first, and the collection of the other type of data and their analysis will be done next (Creswell & Plano Clark, 2018). In the concurrent designs, both quantitative and qualitative data are collected alongside each other. One strand of research (quantitative or qualitative) may be highlighted more than the other in MMR, or they may get equal emphasis. Dörnyei (2007) has provided various combinations of MMR by combining the two features of time order and dominance.

Although quantitative and qualitative research methods have distinct tendencies and research directions which should not be neglected (Morgan, 2018), Johnson and Onwuegbuzie (2004) urge researchers to focus on the relative strengths of both, identifying how they can be incorporated in a single research design to maximize the strengths and minimize the weaknesses of each. Similarly, as Brown (2011) maintains, those researchers who can employ both quantitative and qualitative methods in a way that they reinforce and cross-validate each other will be regarded stronger researchers. Thus, MMR has gained increasing attention and interest in social and behavioral sciences in general since it pays close attention to what is proper and what works in accordance with specific research questions (Tashakkori & Teddlie, 2003) and the contexts in which they are being asked. Following this general trend, researchers in language teaching and learning have used a range of quantitative, qualitative and mixed methods. Actually, MMR is now widely known as a scholarly subarea in TESOL (Mirhosseini, 2018)

In the field of AL, Hashemi and Babaii (2013), in a rather comprehensive study, examined seven international peer-reviewed journals and extracted 273 MMR articles published from 1995 to 2008. The journals were examined to specify how quantitative and qualitative research methodologies were integrated. The criteria to select the articles included the existence of such key terms as mixed-methods, multimethod, qualitative, quantitative, triangulation, integrating methods and combining methods. Scrutinizing the corpus, they noticed 205 articles (about 75%) had employed both quantitative and qualitative methods at different stages of research. The study revealed that concurrent designs had been used more frequently in comparison to sequential designs and that use of detailed mixed designs was limited (Hashemi & Babaii, 2013).

In another study, Riazi and Candlin (2014) reviewed 40 published language teaching and learning articles from 30 journals covering one decade (2002–2011) which were selected using such key terms as "mixed-methods" and "quantitative and qualitative" and were filtered by the year of publication in the field of language teaching and learning. They categorized the articles to the explicit use of "mixed-methods studies" and "quantitative and qualitative studies". Of these, 18 (45%) belonged to the mixed-method category and were published in 13 journals, and 22 (55%) belonged to the category of quantitative and qualitative and were published in 17 journals. They then, scrutinized the articles to see which purpose of mixed-methods research each one followed and how the quantitative and qualitative phases were integrated. The results of their study showed that MMR studies had been primarily quantitative with the addition of some qualitative parts. They also noted that MMR studies were not principled which means that the quantitative and qualitative parts were not integrated and combined in a way that they could best address the research purposes and that methods-mixing was only confined to the data collection stage. Moreover, they provided the readers with the challenges of doing mixed-methods studies, in particular, those faced by the researchers in language teaching and learning.

In light of Tashakkori and Creswell's (2007) definition of MMR as "research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches in a single study or program of inquiry" (p. 4) and Bazeley's (2018) definition in which "integration of data and analyses occurs prior to drawing final

conclusions", it could be argued that high-quality MMR involves mixing not merely in the process of data collection (what is customarily done in the field), but throughout the whole study from writing abstract, to forming research questions, to sampling, to data collection, to data analysis, and, as a final point, to interpretation (Hashemi, 2012). That is, as Fetters and Molina-Azorin (2017) put it, integration needs to be applied to the entire process of MMR and not merely to data or results. Thus, it would be too naïve to accept a study as an MMR study only because of the use of both quantitative and qualitative phases in a single study (Bryman, 2008) and for merely combining the findings from both approaches (Li & Liu, 2021).

Significance of the Study and Statement of the Problem

An important point in searching the literature of MMR studies is the fact that, firstly, there has been little concentration on the ways quantitative and qualitative phases might be integrated to reach improved results and diminish the weaknesses of the two strands of research (Hashemi & Babaii, 2013). That is, as Hitchcock and Onwuegbuzie (2020) maintain, the extent to which qualitative and quantitative phases are mixed specifies if the study can be described as MMR or not. The less the studies are combined, the more likely that the overall analysis will indicate a parallel analysis, which cannot then result in a MMR study. Secondly, there is still a paucity of research in AL focusing on the necessity of principled mixing at various stages and throughout the whole study. In other words, the literature of AL suffers a lack of studies mixing the quantitative and qualitative parts in a complementary way. Thirdly, investigating the issue of mixing and the manner in which it has been put into effect in AL research in the very recent years would, we think, be of importance to see whether the situation has improved and whether or not we are on the right track. Thus, the present study aimed at attaining the three goals mentioned including recognizing the status quo of MMR in AL, investigating the nature of various sections of MMR studies, and specifying the way the pattern of employing MMR has changed over the past few years.

With account to the previously-mentioned methodological concerns in MMR and bearing the aims of the study in mind, we decided to address the claimed MMR questions, research designs, sampling designs, and inference quality in MMR in AL. To this end, the following research questions were formulated for the present study:

Research question 1 ($RQ_{1)}$. What kinds of research questions are formulated in MMR in the field of AL?

RQ_2. What kinds of research designs are utilized when method mixing is exploited in AL research?

RQ_3. What kinds of sampling designs are utilized in MMR in the field of AL?

RQ_4. To what extent are the results mixed in data interpretation (Discussion) stage?

RQ_5. How are general conclusions or meta-inferences developed in AL MMR studies?

RQ_6. Has the trend of publication of MMR studies changed since the introduction of this approach up to now?

RQ_7. What are the challenges of conducting MMR studies from the viewpoints of AL researchers?

Methodology

Corpus of the Study

In the present study, seven peer-reviewed AL journals published by such internationally renowned publishers as Cambridge Core, Oxford Academic, Sage Journals, and Wiley Online Library, all indexed in Journal Citation Reports (JCR), were selected based on five criteria. Firstly, all the journals selected belonged to quartile one of the JCR and were among the professional journals listed by Weber and Campbell (2004) and Egbert (2007). Secondly, all the journals were published in English language (because some journals of the field like Terminologie et Traduction are published in other languages). Thirdly, they were not limited to only one specific area of language teaching and learning (like Assessing Writing). Fourthly, the journals selected all enjoyed an impact factor (IF) higher than one. Finally, two senior lecturers in AL were consulted over the sample selection and screening processes. The corpus selected was a whole body of articles distributed over a time span of seven years, from 2010 to 2016. The seven journals selected included *Applied Linguistics (*AL*)* published by Oxford Academic*, Language Learning* (LL), *The Modern Language Journal* (MLJ), and *TESOL Quarterly* (TQ) published by Wiley Online Library*, Language Teaching Research* (LTR), and *Language Testing* (LT) published by Sage Journals*,* and *Studies in Second Language Acquisition* (SSLA) published by Cambridge Core with 2020 JCR IFs of *5.74, 4.66, 4.75, 3.69, 3.89, 3.55, and 3.40,* respectively.

Data Collection

The way toward collecting the data sources progressed as follows: At the initial step, all electronic versions of the articles published from 2010 to 2016 in the above-mentioned journals were collected. The electronic versions of the selected journals were open-access to the datasets of the library. There were a total of 1,314 articles in the journals mentioned above with 191 in AL, 204 in LL, 182 in LTR, 179 in LT, 152 in SSLA, 237 in MLJ, and 169 in TQ. To see if the design in each study involved mixing at such various stages of the articles as sampling, data collection, and/or data analysis, the researchers scrutinized each article's abstract, keywords, and methodology sections. To make sure of the inclusion of every article published in the journals into the corpus of the study, the search function of Adobe Reader was also employed, searching for key words and phrases such as combining methods, integrating methods, mixed methods, multimethod, multitrait, qualitative, quantitative, and triangulation. In this initial screening, 271 articles (21% of the total corpus) were identified to have at least one of the above-mentioned key words and phrases and could go for the next step of the analysis. All the selected articles went through a second phase of screening in which inclusion of both quantitative and qualitative parts was required for the given article to be included in the final sample of the study. In this phase of screening, although it happened that some researchers claimed to have run a mixed methods study, it was revealed that the article did not meet principles of MMR in the second screening. There were some studies which belonged to a larger one which was an MMR, whereas the section reported in the article was limited to the qualitative or quantitative part. In other cases, use of key words was not the indication of an MMR, but they were used for other purposes. Thus, we found that 51 articles in the pool fell short of the criteria and that, finally, 220 articles (17% of the total corpus) were identified as MMR studies. Table 1 shows the frequency of MMR studies in the seven journals selected.

Table 1
Frequency of MMR Studies in the Journals Screened

Articles / Journal	All papers	Initial screening	Second-phase screening (MMR)
AL	191	34 (18%)	26 (14%)
LL	204	45 (22%)	27 (13%)
LTR	182	48 (26%)	43 (24%)
LT	179	33 (18%)	30 (17%)
SSLA	152	26 (17%)	21 (14%)
MLJ	237	57 (24%)	48 (20%)
TQ	169	28 (17%)	25 (15%)
Total	1314	271 (21%)	220 (17%)

As it is evident from Table 1, on average, nearly 17% of the articles screened in the seven journals selected for investigation were mixed in method. Following the recognition of the potential studies, various sections of the articles were screened by the researchers using qualitative content analysis to provide a better understanding of how mixing methods happened in MMR articles.

To delve into the challenges of conducting MMR studies, an open-ended questionnaire (Appendix A) was emailed to 43 national and international researchers in the field of AL from various countries like America, Australia, England, Hungary, Iran, and Japan. The selected researchers had already published at least one MMR research article in the journals chosen by the researchers. Additionally, they were all senior lecturers holding Ph.Ds. in AL. Twenty-seven of them were male and the rest were female. The return rate of the questionnaire was nearly 21%. The questionnaire included six open-ended questions which were validated by two experts in the field holding Ph.Ds. in AL with an interest and expertise in MMR.

Data Analysis

As mentioned previously (in the Data collection section), two phases of screening were done to specify all MMR studies in the corpus. The initial screening stage aimed at identifying all the articles in which the keywords mentioned (as explained earlier in the Data collection) were present. In the second phase of the screening, the content of each article was analyzed qualitatively through an iterative process in which the relevant sections of the articles were read and examined by both the researchers and the key points were highlighted based on the following coding scheme. It should be mentioned here that, the inter-coder reliability between the researchers was estimated to be high enough ($r = 0.97$) which showed a good degree of correspondence between the researchers as to what to consider as an MMR. In very rare cases of discrepancy between the researchers as to whether or not the given study was mixed in method, a third specialist holding a Ph.D. in AL with an interest in and familiarity with MMR was consulted. In fact, we examined the articles paying close attention to the four sections of research questions, research designs, sampling designs, and inference quality in the discussion section. To determine the relevance of these sections to each other, the studies were also examined to see if the research questions adopted had any influence on the designs and sampling designs of the studies and if the researcher/s had supported their findings obtained from one sort of data with the findings of the other sort. The validity of the qualitative data analysis was judged by seeking the views of two experts in the field based on whose ideas, necessary adjustments were made.

Coding Scheme

In the analysis procedure of the study, we took some notes regarding the contents of the articles and employed the following coding scheme:

Research questions
- Quantitative
- Qualitative
- Hybrid

Research designs
- Concurrent
  - Triangulation
  - Embedded
  - Transformative
- Sequential
  - Explanatory
  - Exploratory
  - Transformative

Sampling design
- Concurrent
  - Identical
  - Parallel
  - Nested
  - Multilevel
- Sequential
  - Identical
  - Parallel
  - Nested
  - Multilevel

Inference quality
- Design quality
  - Design suitability
  - Design adequacy
  - Within design consistency
  - Analytic adequacy
- Integrative rigor
  - Interpretive consistency
  - Theoretical consistency
  - Interpretive agreement
  - Interpretive distinctiveness
  - Integrative efficacy

Each of the above-mentioned categories and typologies are elaborated in detail here.

Research Questions were examined using the three types of research questions explained by Riazi and Candlin (2014) who asserted that there was a need to include a new type of research question into mixed methods studies called "hybrid" or "integrated" (Tashakkori & Creswell, 2007, p. 208) in addition to purely quantitative and qualitative ones. This new form of question addresses mixing the quantitative and qualitative methods of research (Creswell & Plano Clark, 2007) and requires meta-inference or integrated mixed-inference. It is to be noted that the internal and external validity in relation to quantitative methods and the trustworthiness and credibility of the interpretations in

relation to qualitative methods are to be addressed by the quality of inferences drawn in MMR studies (Tashakkori & Teddlie, 2003).

The methodological framework presented by Creswell (2009) was utilized for the analysis of research designs which has also been adopted in other studies on the topic including that conducted by Hashemi (2012) and Hashemi and Babaii (2013). The framework proposed by Creswell (2009) has two classifications; the first one, concurrent design, employs qualitative and quantitative methods simultaneously and is categorized into three sub-designs: (a) Concurrent Triangulation Design; (b) Concurrent Embedded Design; and (c) Concurrent Transformative Design. The second one, sequential design, makes use of the methods in various stages of the study one after the other, and has three sub-designs: (d) Sequential Explanatory Design; (e) Sequential Exploratory Design; and (f) Sequential Transformative Design. Although some other classifications have been proposed by the researchers since then (Creswell, 2015; Creswell & Plano Clark, 2018; Plano Clark & Ivankova, 2016), we employed this classification to enable us to compare the results obtained in our study with those of the previously-conducted studies of the ilk more consistently.

Collins et al. (2007) have proposed a model of sampling in MMR studies which classifies the mixed methods sampling designs based on "(a) the time orientation of the components and (b) the relationship of the qualitative and quantitative samples" (p. 276). There are two dimensions for time and four dimensions for relationships, creating a total of eight possible combinations. Concurrent and sequential categories are the subdivisions of the first element (i.e., time orientation). For each of these two main categories, four groups of sampling designs have been presented to account for the relationship between qualitative and quantitative samples which include identical design wherein the same members participate in both qualitative and quantitative phases of the study; parallel design which implies that there are different samples for the qualitative and quantitative phases of the study, but they are taken "from the same underlying population" (Collins et al., 2007, p. 277); nested design which entails that the members chosen for one phase of the study are drawn from the sample of the participants selected for the other; and finally multilevel design in which the samples under investigation are selected from "different levels of the investigation" (Collins et al., 2007, p. 277).

Tashakkori and Teddlie (2008, p. 112) propose an "integrative model of inference quality in mixed methods research" that includes two general subdivisions: design quality and integrative rigor. The former includes design suitability, design adequacy, within design consistency, and analytic adequacy and the latter includes interpretive consistency, theoretical consistency, interpretive agreement, interpretive distinctiveness, and integrative efficacy (pp. 112–116). Since handling all the above-mentioned components of Tashakkori and Teddlie's (2008) Inference Quality is not feasible, and to save space in a research article, we chose to focus on the integrative efficacy component which explores "the degree to which inferences made in each strand of mixed methods study are effectively integrated into a theoretically consistent meta-inference" (p. 115). This means that we scrutinized the discussion and conclusion sections of the articles to see if the findings and inferences which were obtained from the quantitative and qualitative phases were integrated and reported as meta-inferences.

Data Analysis of the Interviews

To analyze the content of the responses to the open-ended questionnaire sent through email and to generate a theory from the qualitative data, the researchers took the three coding steps in the grounded-theory approach inductive content analysis including open coding, axial coding, and selective coding (Strauss & Corbin, 1998). At first, the textual data were broken into chunks in order to detect categories. Then, in the axial coding phase, higher-order concepts were shaped and connections between categories were made. Finally, at the last phase, some core or pivotal

categories were selected for data description. The core categories obtained were then quantitized (Dörnyei, 2007) (i.e., subjected to frequency analysis, and tabulated), which are presented in the Results and Discussion section below.

Results and Discussion

In this part, the answers to the research questions are provided one by one, and the findings of each one are elaborated and discussed thoroughly.

RQ_1: What kinds of research questions are raised in mixed methods studies in the field of AL?

We found research questions were incorporated in such various parts of the articles as abstract (95), introduction (17, 40, 75, 88, 122), literature review (91, 107, 127), method section (2, 80, 83, 98), and even discussion (29). Based on what Riazi and Candlin (2014) have suggested, we classified them into three categories of quantitative, qualitative, and hybrid/integrated research questions as mentioned earlier (for further information in regard to the types and examples of research questions, see Riazi & Candlin, 2014). It is to be noted here that in some studies, research questions were not explicitly stated, but were raised implicitly in the text (24, 26, 45, 154, 170, 178, and 185). In some other articles (10% of the total), there was no explicit research question at all (6, 20, 42, 74, 85, 135, 160, 204, etc.).

It is worth mentioning that, related to the issue, Soodmand Afshar and Ranjbar (2017), examining 200 research articles in AL, found that research questions might be included implicitly in the abstract or even at the beginning of the method section. Moreover, they concluded that RQs were highly important for the article authors since they guided both them and the readers through the objectives and the outcomes of a study. Table 2 presents the frequencies with which each type of research question was used in each journal.

Table 2
Frequency of the Type of Research Questions Utilized in the MMR Articles of the Journals Screened

Articles / Journal	Quantitative RQs	Qualitative RQs	Hybrid RQs	Articles with no explicit RQ
AL	27 (60%)	18 (40%)	0	9
LL	44 (81%)	10 (29%)	0	9
LTR	53 (60%)	35 (40%)	0	10
LT	41 (62%)	21 (32%)	4 (6%)	7
SSLA	38 (78%)	11 (22%)	0	3
MLJ	76 (72%)	28 (26%)	2 (2%)	9
TQ	33 (62%)	19 (36%)	1 (2%)	4
Total (461 RQs)	312 (68%)	142 (30.5%)	7 (1.5%)	51

As shown in Table 2, most questions were quantitative in nature with a total of 68%. Qualitative questions (30.5%) were nearly as many as half of the quantitative ones; however, this number varied in different journals screened. In AL, LTR, LT, and TQ, qualitative questions were even more than half of the quantitative ones, but in LL, SSLA, and MLJ, they were fewer than 50% of quantitative questions. What catches attention here is the very low percentage of hybrid RQs. Considering what the proponents of MMR studies maintain, there were only seven research questions (1.5%) which were aimed at giving the readers a fuller understanding of how quantitative and qualitative results would support each other. They are listed here:

> [23] *To what extent and how* do the aspects of writing that explain ESL essay holistic scores vary in relation to rater experience? (Barkaoui, 2010, p. 34)

> [51] *To what extent do the qualitative and quantitative data converge and correspond with* those features used in the evaluation of speaking proficiency? (Plough, Briggs, & Bonn, 2010, p. 238)

> [61] *To what extent and in what ways* can eye-tracking technology shed light on the cognitive processing of participants completing onscreen reading test (IELTS) items? (Bax, 2013, p. 446)

> [61] *To what extent and in what ways* are successful readers differentiated from less successful readers in terms of their eye movements while completing onscreen reading test (IELTS) items? (Bax, 2013, p. 446)

> [61] *To what extent and in what ways* are successful readers differentiated from less successful readers in terms of their cognitive and metacognitive processing while completing onscreen reading test (IELTS) items, as evidenced from eye movement data and stimulated retrospective interview data? (Bax, 2013, p. 446)

> [94] *Do qualitative data* help explain the results of the *path analysis*? If so, how? (Nishino, 2012, p. 383)

> [119] *What quantitative and qualitative differences* exist in the perceived difficulty of narrative tasks in French as an L2? (Préfontaine & Kormos, 2015, p. 99)

As it can be seen, from these seven RQs, only numbers 51 and 94 examine how data from the quantitative phase and the qualitative phase support each other. Other ones are questions that are aimed at reaching the result using both sorts of data. As we analyzed the articles, we found these seven RQs were those with both quantitative and qualitative results in an integrated manner; however, only in two of them results verified each other and the questions led to stronger inferences (as it is explained in the Discussion).

One point should be noted here. Many authors may choose to state separate qualitative and quantitative questions, because the phenomena under consideration are best addressed by different research methods, but the surrounding text, especially in the Results and Discussion sections, may well address how the qualitative and quantitative data together enrich our understanding of the phenomena being studied. This is, for certain, in need of a careful plan to pull qualitative and quantitative data together later in the study although the questions are expressed separately. Thus, the presence of such a gap in this specific domain of research may be analyzed from various perspectives. This lack of suitable hybrid research questions in MMR studies may be due to the lack of knowledge and/or sufficient skills on the part of the AL researchers conducting MMR. This line of reasoning is corroborated by Onwuegbuzie and Leech (2006) who maintain, ". . . forming research questions is much more difficult in mixed methods studies than in monomethod (i.e., quantitative or qualitative) investigations because it involves the formation of both quantitative and qualitative research questions within the same inquiry" (p. 477).

What adds to the importance of RQs is the fact that formulating appropriate research questions is essential in MMR since they provide a right path for the method sections of the articles. Especially associated to this issue are those inferences or conclusions resulted from the analysis of quantitative and qualitative data that could be utilized to respond to the research questions formulated in relation to the purpose(s) of the study (Riazi & Candlin, 2014). Thus, employing only quantitative/qualitative types of research questions may not meet the needs of a true mixed methods study. We sense that a hybrid research question has the best potentiality to pave the way for the integration of quantitative and qualitative phases of the study and the inclusion of all these three types of RQs is, we suppose, the least one might expect in a mixed methods study.

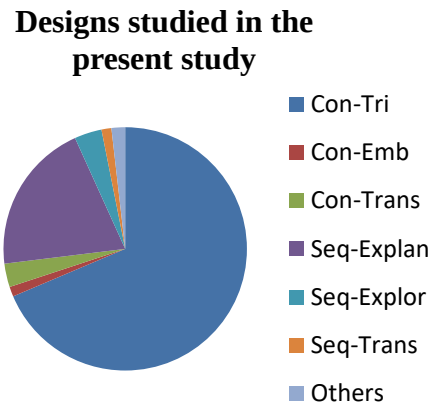
RQ_2. What kinds of research designs are utilized when method mixing is exploited in AL research?

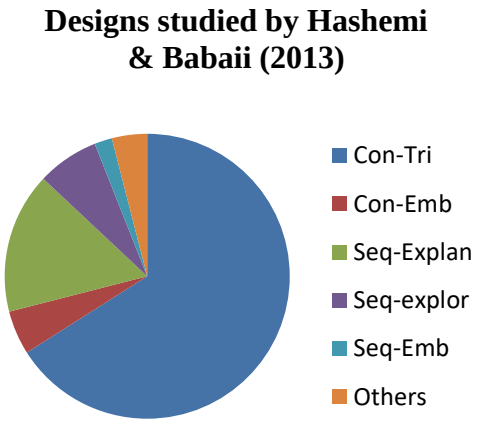
Table 3 demonstrates the frequencies with which each research design was used in the journal articles scrutinized.

Table 3
Frequency of Research Designs Used in MMR Articles of the Journals Screened

Design / Journal	Concurrent			Sequential				
	Triangulation	Embedded	Transformative	Explanatory	Exploratory	Transformative	Other	Total
AL	23 (88%)	0	0	2 (8%)	1 (4%)	0	0	26
LL	17 (63.5%)	0	1 (3.5%)	8 (29.5%)	1 (3.5%)	0	0	27
LTR	28 (65%)	1 (2.5%)	1 (2.5%)	6 (18%)	4 (9.5%)	1 (2.5%)	2	43
LT	20 (66.5%)	0	0	8 (26.5%)	1 (3.5%)	0	1 (3.5%)	30
SSLA	15 (71.5%)	0	4 (19%)	2 (9.5%)	0	0	0	21
MLJ	34 (71%)	2 (4%)	0	11 (23%)	0	1 (2%)	0	48
TQ	14 (56%)	0	1 (4%)	8 (32%)	1 (4%)	0	1 (4%)	25
Total	151 (68.9%)	3 (1.3%)	7 (3.1%)	44 (20%)	8 (3.6%)	3 (1.3%)	4 (1.8%)	220

As indicated in Table 3, a great number of studies were concurrent in comparison to sequential ones. Concurrent triangulated studies were the most frequently adopted ones (68.9%) and embedded design was the least frequently used one among concurrent design types (1.3%). Among sequential design types, the percentage of transformative design (1.3%) was the same as that of concurrent embedded design making it stand as the least frequently used design type in this category. The design that was most commonly used in sequential category was the explanatory design (20%). Sequential exploratory and concurrent transformative designs formed 3.6 and 3.1% of the research designs, respectively. The findings in this section are in line with the findings of Hashemi and Babaii (2013) in that they also found that concurrent designs were more frequently used than their sequential counterparts. Similar to our findings, they also found that concurrent embedded designs and triangulation designs were respectively the least and the most frequently adopted designs among the other types of concurrent designs. Our results also corroborate Hashemi and Babaii's findings with respect to the sequential designs. That is, explanatory, exploratory, and embedded designs were found to be the most to the least frequently utilized designs respectively in the sequential category in both studies.





Note. Con= concurrent, Seq= sequential, Tri= Triangulation, Emb= embedded, Trans= Transformative, Eplan= Explanatory, Explor= Exploratory

Figure 1. Comparison of Research Designs

Some other research designs not included in the framework proposed by Creswell (2009) were found in the current study which are listed here belonging to the following studies (+ means concurrent and → means sequential):

- Number 37 conducted by Macaro and Lee (2013) was qualitative→quantitative→qualitative
- Number 60 by Zhao (2013) was quantitative→qualitative→quantitative
- Number 210 by González-Lloret and Nielson (2015) was quantitative→quantitative →qualitative
- Number 211 done by Saito (2015) was quantitative+ qualitative→ quantitative+ qualitative.

To further our understanding of how researchers addressed their designs, the data were examined in depth to provide a comprehensive account of the issue. The following extracts are only some examples to show how the design type was selected and utilized by the researchers (the design of each study is given in the parentheses and the underlined parts are the language used by the author/s specifying the designs of their studies).

> *[13] All classes were videotaped and observed by the researcher, who always sat at the back of the classroom to ensure the consistency of FFI treatment for the entire project. Two weeks after the end of the lessons, all students took posttests and were interviewed. (Concurrent triangulation design, Saito, 2013, p. 8)*

> *[24] This was a two-phase, sequential mixed-methods study (Creswell, 2003) with quantitative survey data being collected first, followed by semistructured qualitative interview data. (Sequential explanatory design, Chang, 2010, p. 135)*

> *[73] Qualitative and quantitative analyses of the data were conducted chronologically. First of all, the researcher transcribed the randomly selected examinees' role-play performances across different proficiency levels using the CA notation system (Appendix B) for turn-by-turn sequential analyses, which informed the development of the interaction-sensitive data-driven rating criteria (further discussion in the Results section). Secondly, a many-facet Rasch measurement with four facets (examinee, rater, role-play task, and rating criteria) was employed using the computer program FACETS, version 3.0. (Sequential exploratory design, Youn, 2015, p. 206)*

> *[87] The data for the study was largely qualitative in nature and consisted of students' weekly self-reflection blogs, (…) qualitative analysis of students' and teachers' perceptions and class performance throughout the semester was conducted, supplemented with a quantitative analysis of the fluency, complexity, and accuracy of students' oral performance in the descriptive task. (Concurrent embedded design, Lai, Zhao & Wang, 2011, p. 86)*

> *[104] Out of the 350 original volunteers, 79 completed the entire project, 39 L2 learners (L1 BP and L2 English) and 40 L3 learners (…) Twenty-nine of the multilingual participants were also interviewed after all tests had been completed. (Thompson, 2013, p. 692) (Sequential transformative design since the research hypothesis is directional: Multilingual learners will attain higher scores on a differentiated language aptitude test than bilingual language learners (p. 692)).*

Moreover, some authors (nearly 9%) used mixed methods terminology directly in their articles and in some studies (nearly 11%) the quantitative and qualitative phases were reported separately. In some other studies, such terms as triangulation, multimethod, and integrating *methods* could be seen. Some extracts are presented here to shed more light on the issue.

> *[9] To address this gap, a mixed-methods approach was used in the present study to gain a deeper understanding of (…). (Isaacs & Trofimovich, 2012, p. 475)*

> *[33] (…) we further examined the results of the qualitative piece by probing specific quantitative questions (…). (Brannan & Bleistein, 2012, p. 524)*

[62] The type of mixed methods design employed is an integrative design (…) (Jeong, 2013, p. 348)

[69] Quantitative results were also triangulated with qualitative rater comments (…) (Yan, 2014, p. 501)

[92] This study compares descriptive quantitative and qualitative data from (…). (Toth, 2011, p. 1)

[94] Thus, in this study I used a multimethods approach using survey as the main instrument supplemented by interviews and observations as the subordinate instrument. (Nishino, 2012, p. 383)

[98] The quantitative analysis that is the focus of this article is supplemented by qualitative data from individual students, reflecting the position that only a combination of quantitative and qualitative data can reveal a complete picture of the nature of language acquisition (…) (Du, 2013, p. 131)

[105] Data were collected through classroom observations, video-recorded classroom interactions, stimulated recalls, interviews, questionnaires, and diaries, all of which were analyzed quantitatively and qualitatively. (Tomita & Spada, 2013, p. 591)

Use of mixed methods terminology and combining its different designs can be regarded as signs of a growing awareness among the researchers of the value of mixing methods. Melzi and Caspe's (2010) assertion that "there is growing recognition of the need to draw on, and in some cases, integrate both quantitative and qualitative approaches in order to gain a more complete understanding" (p. xiii) lends further support to this line of reasoning. Moreover, as Riazi (2016) states, "MMR enables researchers to investigate more complex research issues usually not possible with purely quantitative or qualitative methods" (p. 33). Thus, it might be deemed essential for applied linguists to become familiar with MMR to be able to deal with the interdisciplinary nature of the field and its complicated processes and outcomes.

RQ_3. What kinds of sampling designs are utilized in mixed methods research in the field of AL?

To answer this research question, we calculated the frequency of occurrence of different sampling design types, the results of which are presented in Table 4.

Table 4
Frequency of Sampling Designs Used in MMR Articles of the Journals Screened

Sampling / Journal	Concurrent				Sequential				Total
	Identical	Parallel	Nested	Multilevel	Identical	Parallel	Nested	Multilevel	
AL	17 (65%)	0	2 (8%)	2 (8%)	0	1 (4%)	3 (11%)	1 (4%)	26
LL	10 (37%)	0	7 (26%)	2 (7.5%)	3 (11%)	2 (7.5%)	3 (11%)	0	27
LTR	30 (70%)	0	2 (4.5%)	2 (4.5%)	0	0	5 (12%)	4 (9%)	43
LT	14 (46%)	0	1 (3.5%)	4(13.5%)	1 (3.5%)	0	6 (20%)	4 (13.5%)	30
SSLA	13 (41%)	0	3 (22%)	3 (22%)	0	0	1 (7.5%)	1 (7.5%)	21
MLJ	25 (52%)	0	6(12.5%)	5(10.5%)	3 (6.5%)	0	7(14.5%)	2 (4%)	48
TQ	12 (48%)	0	0	4 (16%)	0	1 (4%)	6 (24%)	2 (8%)	25
Total	121(55%)	0	21(9.5%)	22 (10%)	7 (3%)	4 (2%)	31 (14%)	14 (6.5%)	220

The total percentages in Table 4 display that like concurrent research designs (in Table 3), concurrent sampling designs (74.5%) were more frequently used than the sequential sampling designs (25.5%) in AL MMR studies. The analysis of sampling designs also revealed that more than half (55%) of the studies made use of concurrent identical sampling designs. Sequential nested sampling design (14%) was the second most frequently used one among these eight subcategories. Concurrent multilevel (10%) and nested (9.5%) sampling designs were adopted with almost the same frequency. Receiving a frequency of 6.5%, the sequential multilevel sampling design came to be the next more frequently adopted design. Among various sequential sampling designs, the less frequently employed ones were found to be identical and parallel designs with only three and two percent, respectively. It is interesting to note that among all these 220 articles screened, there was no concurrent parallel sampling design.

To add to our understanding of sampling procedures employed by the researchers, the data were analyzed qualitatively in support of which some extracts are presented here.

> *[9] First, speech samples of 40 native French learners of English were analyzed using 19 quantitative speech measures… These measures were then correlated with 60 native English listeners' scalar judgments of the speakers' comprehensibility. Next, three English as a second language (ESL) teachers provided introspective reports on the linguistic aspects of speech that they attended to when judging L2 comprehensibility. (Sequential multilevel sampling, Isaacs & Trofimovich, 2012, p. 476)*

> *[37] From a total sample of 798 students, 311 were adults at university and 487 were children in the last year of primary school. The researchers collected data via questionnaire and, using a subsample, via interviews. (Sequential parallel and nested sampling design, Macaro & Lee, 2013, p. 717)*

> *[82] Eight tutors participated in the study—2 who taught Italian, 4 who taught Spanish, 1 who taught French, and 1 who taught French and Portuguese… Tutees in this study were enrolled in a lower division FL class and sought tutoring at the academic center. (Concurrent multilevel sampling design, Matthews, 2010, p. 620)*

> *[91] The participants were 48 Japanese students of English in a small liberal arts college in Japan (hereafter, EFL students). A subset of 12 EFL students, 6 males and 6 females, were recruited as informants for the qualitative analyses. (Concurrent nested sampling design, Taguchi, 2011, p. 609)*

> *[97] Questionnaire respondents were invited to volunteer for follow-up interviews. Twenty-eight students from University A and 14 students from University B did so. (Sequential nested sampling design, Busse & Walter, 2013, p. 438)*

> *[110] Immediately following the idiodynamic data collection, participants were interviewed by a research assistant and were asked to account for the changes in their state language anxiety. (Sequential identical sampling, Gregersen, Macintyre & Meza, 2014, p. 578)*

> *[182] …12 volunteered to be involved in the research, and only data from these 12 students are included in the findings. Data were drawn from a variety of sources completed at three junctures of time: the beginning of the course, the end of the course, and after the teaching practicum. (Concurrent identical sampling, Ogilvie & Dunn, 2010, p. 166)*

The findings here are in line with those of previous studies (e.g., Collins et al., 2007; Hashemi & Babaii, 2013) which revealed that concurrent sampling was adopted more frequently than sequential sampling design in AL MMR studies. Our findings showed that concurrent identical sampling design was the most frequently used one, a finding which is similar to the results obtained by Collins et al. (2007) and Hashemi and Babaii (2013). This may not be surprising because it is supposed to be the easiest, least expensive, and most efficient design among all. Comparing the results of the present study to the findings of Hashemi and Babaii (2013), we also found that the pattern of frequency of occurrence of sampling designs in the concurrent category was the same in both

studies. That is, the identical, multilevel, nested, and parallel sampling designs were the most to the least frequently used design types in both. The findings can also be verified by the results of Collins et al. (2007) wherein the pattern of frequency of occurrence of sampling designs in the concurrent category was almost the same as that of our findings in this respect with the exception of concurrent nested and multilevel sampling designs being the second and the third most frequently employed sampling designs, respectively. Furthermore, the least frequently used sampling design in the present study was found to be the concurrent parallel one which was also the least frequently adopted one in the studies done by Collins et al. (2007) and Hashemi and Babaii (2013). On the other hand, unlike what Hashemi and Babaii (2013) reported, in the sequential category, the pattern of frequency of occurrence of sampling designs was not the same except for the sequential parallel sampling design which was the least frequently adopted type in the articles analyzed in both studies. Sequential nested sampling (which was found to be a less frequently used sampling design in Hashemi & Babaii's study), was found to be the second most frequently adopted one in our sample data, a finding which is also in contrast to the results of Collins et al. (2007), who found that all types of concurrent designs except for the parallel design were more frequently used than the sequential ones. In the sequential category (where we found sequential nested sampling to be the most frequently adopted design), Collins et al. (2007) reported that articles with nested and multilevel sampling designs received almost the same frequency of occurrence and were the first and the second most frequently utilized sampling designs. However, unlike our findings, they found the sequential parallel sampling design to be more frequently used than the sequential identical sampling design.

RQ_4. To what extent are the results mixed in data interpretation (discussion) stage?

RQ_5. How are general conclusions or meta-inferences developed in AL MMR studies?

To answer these two research questions, both quantitative and qualitative results are presented and discussed. As Hashemi and Babaii (2013) rightly maintain, lack of operational definitions makes it nearly impossible to address all aspects of the inference quality proposed by Tashakkori and Teddlie (2008). Following a detailed analysis of the results and discussion sections of the corpus of the study, we divided them into three categories based on the extent to which the qualitative and the quantitative phases were mixed: (a) discussions with mixed inferences, (b) discussions which were mixed to some extent, and finally (c) discussions which were not mixed in their inferences. In the first category, the authors of the articles explicitly supported their results from one phase of the study with those from the other one. In the second category, there were some expressions showing traces of the quantitative and qualitative parts, but they were not used consistently and did not add enough to the understanding of the readers about how quantitative and qualitative phases supported each other. In the third category, no sign of mixing could be seen in the discussion to demonstrate that the quantitative and qualitative phases complemented each other's findings. Table 5 presents the frequency of occurrence of these three categories in various journals.

Table 5
Descriptive Statistics for the Degree of Mixing in the Discussion Section

Discussions / Journal	Mixed	Mixed to some extent	Not mixed	Total
AL	5 (19.5%)	6 (23%)	15 (57.5%)	26
LL	2 (7.5%)	9 (33.5%)	16 (59%)	27
LTR	2 (4.5%)	22 (51.5%)	19 (44%)	43
LT	3 (10%)	6 (20%)	21 (70%)	30
SSLA	0	4 (19%)	17 (81%)	21
MLJ	5 (10.5%)	6 (12.5%)	37 (77%)	48
TQ	1 (4%)	8 (32%)	16 (64%)	25
Total	18 (8.5%)	61 (27.5%)	141 (64%)	220

As shown in Table 5, a limited number of articles (8.5%) in the journals screened made their inferences mixed, i.e., the quantitative and qualitative phases came to support each other in a principled manner. Moreover, 27.5 % of the articles used some expressions to show the findings of the quantitative part supported those of the qualitative part; however, in most of the articles (64%) scrutinized, there was no sign to indicate that the quantitative phase supplemented the qualitative one. In none of the discussion parts screened, was there a distinct section offered to integrate the quantitative and qualitative components. Some extracts from various articles are presented here to shed light on the ways authors reported general inferences and mixed them in their articles:

> *[23] Findings from the qualitative data both support and contradict findings from the score analyses. (Barkaoui, 2010, p. 48)*

> *[51] These qualitative characterizations were then compared to the quantitative measures obtained from the analyses of the transcripts to determine (1) whether the qualitative description is consistent with the quantitative measures (i.e., transactional language use, interactional language use, listening comprehension, and pronunciation) obtained for that candidate7 and (2) whether the qualitative description includes features beyond those taken into account in the quantitative analyses. (Plough, Briggs, & Bonn, 2010, p. 250)*

> *[79] Hence, the quantitative and qualitative analyses complement each other; the emphasis, however, remains on the former, not in the least because of the corpus's magnitude. (Bollen & Baten, 2010, p. 420)*

> *[94] Qualitative findings will thus help us interpret the results of the path analysis.*

As regards students' conditions, the interview data partly explains how students' conditions influenced classroom practices. (Nishino, 2012, p. 392)

> *[98] The quantitative analysis that is the focus of this article is supplemented by qualitative data from individual students, reflecting the position that only a combination of quantitative and qualitative data can reveal a complete picture of the nature of language acquisition during study abroad. (Du, 2013, p. 131)*

These are only a few examples in the large sample chosen for the present study which show how the results from both (quantitative and qualitative) phases have been mixed in the analysis and interpretation stages. This lack of integration quality in MMR is also reported by O'Cathain, Murphy, and Nicholl (2007) and Hashemi and Babaii (2013), an argument which might be attributable to lack of familiarity with MMR, its concepts, and principles on the part of researchers. This short acquaintance might be the most likely reason why applied linguists have not been able to guarantee the establishment and the quality of mixing in MMR yet. The difficulty in putting MMR into practice may be regarded as another reason for this mere merging of qualitative and quantitative data rather than the development of a kind of data which is heavily rooted in various pieces of evidence from these two independent strands.

RQ_6. Has the trend of publication of MMR studies changed since the introduction of this approach up to now?

As we scrutinized the published articles in which MMR was employed, we found that there has been an increasingly growing awareness and interest among the AL researchers to conduct MMR. As compared to the findings of Hashemi and Babaii (2013), who investigated seven journals during a time-span of 14 years (from 1995 to 2008) and found a total of 205 MMR studies, we found 220 MMR studies published during only seven years (from 2010 to 2016) which is half the publication time period as that in Hashemi and Babaii (2013). This becomes even more meaningful when we take the fact into consideration that the number of journals scrutinized in both studies was identical (seven in each) and that almost the same journals were selected and scrutinized in both studies with the only exception being journal of *English for Specific Purposes* being analyzed by Hashemi and Babaii

(2013), instead of which we analyzed *Studies in Second Language Acquisition* due to the limitations of datasets of the library. This may be regarded as a sign of a mounting concern among AL researchers to integrate quantitative and qualitative methods to attain more comprehensive outcomes. AL researchers seem to stand on the position that adding another component (either qualitative or quantitative) to their study could strengthen it. However, the sad point is that this mixing of methods is still limited to the data collection as Riazi and Candlin (2014) noted and that the traces of mixing in such other parts of research articles as research questions and inferences in the discussion section are not vastly observable.

RQ_7. What are the challenges of conducting MMR studies from the viewpoints of AL researchers?

The data obtained from the interview questions were analyzed through the three-phase Grounded Theory approach inductive content analysis as mentioned earlier, as a result of which three core categories were identified which were then quantitized (Dörnyei, 2007), subjected to frequency analysis, and tabulated in Table 6.

Table 6
The Selected Codes of the Responses of the Respondents on MMR

Rank	Themes	Frequency (out of 9)	Percentage
1	Nature of the problem determines the method	7	78%
2	Lack of knowledge of principled mixing and lack of expertise are the main challenges of conducting MMR studies	8	89%
3	Training needed on how to conduct MMR studies	8	89%

Nature of the problem determines the method

As it is evident from Table 6, the purpose for which a study is conducted and the problem which is intended to be solved in a study determine the research method through which the study should be conducted. One of the respondents asserted,

- There is indeed nothing wrong with using pure quantitative and/or qualitative research methods if they are appropriate for unfolding research questions.

This implies that each method (i.e., either quantitative or qualitative) can be employed to answer its related topics and questions. This means that the researchers should use MMR only if 'Qualitative or Quantitative alone cannot adequately cater for the issue under investigation' or when dealing with 'complex problems' because they 'require more sophisticated data sources and higher levels of analysis' as pointed out by the respondents. In other words, the method of a study should be centered upon its nature and types of research questions. The quantitative analysis of the articles and the great number of studies conducted either quantitatively or qualitatively published in the leading journals of the field reinforce the idea that using either one of these methods separately still offers its own benefits to the researchers. In support of this, another respondent, showing sufficient knowledge of MMR, mentioned,

- We do MMR for a specific purpose e.g., initiation, development, triangulation, expansion, etc., not just because it is in vogue.

This is a very important point and a serious consideration to be borne in mind. I (the first author of the present study) have frequently seen the post-graduate students seeking appropriate designs for their theses/dissertations, term projects, etc., state that they have decided to select an MMR

design simply because it is more 'fashionable', 'prestigious', 'eye-catching', etc.! After all, we do not select MMR designs to attract the attention of supervisors, journal reviewers and editors, promotion committees, etc., rather, we decide to mix a study in method in accordance with the purpose behind the study and the nature of the issue to be investigated where a mono-method design cannot work alone.

Lack of knowledge of principled mixing and lack of expertise as the main challenges of conducting MMR studies

Analyzing the contents of the responses to open-ended questions, we found that merging quantitative and qualitative methods to give 'an overall comprehensive picture grounded in both approaches' is the most problematic area in conducting an MMR study. Almost all the respondents (89 %) agreed upon the difficulty of the integration of the interpretations especially in a 'principled' rule-governed systematic manner which resulted in a picture that was 'distorted' and 'seen as two halves'. The difficulty in linking the methods together might be due to 'immaturity' of the researchers, having difficulty in 'defining their MMR in terms of a particular purpose', 'not knowing the purpose and philosophy behind conducting MMR', and unfamiliarity 'with the literature of MMR' from the viewpoints of the respondents.

Another challenge faced by the researchers in conducting MMR studies as reported by the respondents was lack of expertise on the part of the researchers. Since MMR has still a long way to go and 'is a recent trend in AL', the researchers are not yet competent enough 'to make good use of MMR as related to the design of MMR studies'. Some other respondents also highlighted that the incompetency of the researchers led to an 'inability to combine things into one unit [which] makes the work faulty'.

Training needed on how to conduct MMR studies

As the results of the analysis of the responses to the open-ended questionnaire revealed, training on how to conduct MMR studies was an urgent need in the field of AL because in comparison to some other fields such as Education, Sociology, and Nursing, 'AL researchers are lagging behind' in this respect. The respondents had consensus over the need for training and instruction 'not only to raise their students' awareness of MMR theoretically', but also to provide them 'with more courses dealing practically with doing MMR'. Thus, training on MMR studies is deemed essential to meet the challenges faced by the researchers which is supported by the remarks of respondents, one of whom maintained how to conduct MMR 'should be a mainstay of all research methods syllabi'.

Conclusion and Implications

Researchers in AL seem to have become increasingly aware of the strengths of adopting mixed-method approach for the conduct of their studies and, in practice, they mostly prefer conducting MMR compared to pure quantitative or qualitative paradigms (Soodmand Afshar & Hafez, 2021). However, this remains in pressing need of a sound conceptualization of MMR that could pave the way for them to move towards conducting a principled rule-based mixing at the deeper levels of analysis and interpretation. This systematic use of MMR in AL, as an interdisciplinary field, can enhance knowledge base of the researchers and contribute to the development and maturity of the field. What is required then is an awareness of the advantages an all-out principled well-mixed MMR study can provide. Gathering extensive quantitative and qualitative data to eliminate the partiality or inadequacy of the conclusions without drawing upon the principles of MMR thus seems to be only a superficial and awkward combination of the two datasets. This sort of "expanding the scope of the study by adding some breadth or depth to a predominantly qualitative or quantitative study

without necessarily mixing the two methods in principle" (Riazi, 2016, p. 35) is what is called "eclectic MMR" in the categorization proposed by Riazi and Candlin (2014). Mason (2006) stresses that although this type of research (i.e., eclectic MMR) is easy to conduct, it does not take the researcher very far away from the boundaries of the mono-method research.

Many MMR studies examined in the present study were conducted based on the guidelines and principles of various research designs proposed for mixed methods studies. This integration of quantitative and qualitative methods in a systematic way has proved to be fruitful when conducting research in AL. However, the major concern of these "principled eclectic" mixed methods studies, which are mainly concentrated upon observing the principles and guidelines of research design (Riazi, 2016, 2017), is the collection and analysis of quantitative and qualitative data to answer their pertinent research questions. In this sense, they are unable to move beyond the technicalities of research design (Riazi, 2016) and that the integration of these two methodologies does not occur in all stages of a research project which, we assume, is of crucial importance in a real MMR study. Juxtaposing various designs and procedures with marginalization of an epistemological understanding of MMR will only distance the researchers from a meaningful knowledge and understanding of the issue (Mirhosseini, 2018). What is needed then is an appropriate methodological approach to collect and analyze both quantitative and qualitative data regarding the hybrid nature of research problems, an innovation in the overall research designs and an integration of different methods to make well-justified meta-inferences about research problems. "Innovative MMR" studies in AL are thus needed to be conducted wherein mixing quantitative and qualitative strands of research has a logical and purposeful philosophy behind and mixing occurs throughout the whole study, not only in sampling designs, but also in formulating research questions and in making inferences and interpretations. Moreover, such studies as the present one have the capability of demonstrating how methods mixing should be conducted to respond to the requirements of various research problems, an argument which is also corroborated by Riazi (2016, 2017) and Gobo (2016) who put emphasis on merging the methods by highly integrating the quantitative and qualitative methods. This methodological approach can thus provide AL with a better recognition of the gaps in various layers of research problems and offer more rigorous inferences which are the real requirements in the current status of MMR in our field. Consequently, different stakeholders including curriculum developers, syllabus designers, and Research Methodology course instructors are recommended to enhance their students' and novice researchers' knowledge and awareness of mixing methods. This can be done by developing, designing, and providing research methodology courses which pay due attention and dedicate sufficient time to MMR. Also, devotion of some special issues of the leading journals of the field to publishing either on the topic of MMR itself or publishing well-balanced studies adopting MMR paradigm is deemed necessary.

The current study also delineated the status quo of MMR in AL. That is, the findings revealed that AL researchers have recently become increasingly aware of and interested in conducting MMR. To be exact, we found 220 MMR studies published during only seven years from 2010 to 2016 in the journals screened which is as much half the publication time period as that in other similar studies, e.g.,-Hashemi and Babaii (2013) who only found 205 MMR studies published during a 14-year time span from 1995 to 2008 in exactly the same number of and almost the same journals as those of our study. This might imply and suggest that AL researchers in general, and the novice researchers and the post-graduate studies students in particular, have now noted the new trends of research in their field, which seem to favor mixing, and pursue them taking their strong points into account and avoiding their weak points if they intend to get accepted by and identify with their discourse community. Further research is needed to shed light on the strategies which can help researchers integrate quantitative and qualitative findings better, promote the inference quality of the Discussion sections of MMR studies, and also provide especially the novice researchers with some standard guidelines on how to report MMR studies.

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Appendix A: Open-ended questionnaire sent through email

Dear professor/researcher,

My professor and I are conducting a study on the issue of mixing quantitative and qualitative methods (i.e., mixed methods research) in the field of Applied Linguistics. Your kind responses to the questions will be of great value to the researchers to figure out the challenges and problems of conducting mixed methods research (MMR) studies. Many thanks for your precious time and kind attention in advance.

1. To what extent do you think conducting MMR studies is necessary in the field of Applied Linguistics? Why?
2. What are the challenges of conducting MMR studies?
3. What do you think is the most difficult part of conducting MMR studies (i.e., data collection, data analysis, data interpretation, design, sampling, etc.)? Why is it so?
4. Some believe that mixing inferences at the data interpretation stage is the most difficult part of doing MMR studies. Do you agree? Why? Why not? Please elaborate.
5. Are the researchers in the field of Applied Linguistics successful enough in conducting MMR studies? If not, in what stage/s do you think they have not performed well?
6. Is there any need to raise consciousness of Applied Linguistic researchers of how to conduct MMR? Why and how?

Thank you very much again.

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