Systematic literature review on the utilization of theoretical underpinnings in virtual exchange research

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Abstract

Virtual Exchange (VE) research is a subset of the technology enhanced learning field that has grown exponentially in the last decade. A critical step in the growth of an emerging academic field is to reflect on past research to understand what has been done well and what can be improved. This Systematic Literature Review (SLR) contributes to this reflective process by examining if a common criticism of technology enhanced learning research in Higher Education (HE) – the under-utilization of theoretical underpinnings in research – extends to the niche field of VE research. Using a qualitative meta-synthesis methodology, 42 qualitative and mixed method articles on VE were analyzed for theoretical underpinning usage, application, and advancement. Almost half of the articles explicitly used theoretical underpinnings in the conceptualization, data collection and analysis, and discussion of results. About a third of the articles explicitly used theoretical underpinnings in the design of the VE, but not necessarily in the research design. No articles reported adding to or advancing current theoretical underpinnings nor creating new ones. The results of this study show VE research is maturing but is not yet fully mature in the application of theoretical underpinnings in research. Also, this study contributes to analysis of theoretical underpinning usage by demonstrating that theoretical underpinnings are utilized also in course design, not just research design.

Keywords: virtual exchange; theory; theoretical underpinnings; systematic literature review.

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1.   Introduction

The research and practice of VEs has developed from an ad-hoc, teacher initiative pedagogy employed largely in language learning and business fields to a top-down internationalization tool in HE encouraged by national and institutional policies across academic disciplines (Dooly, 2017; O'Dowd, 2016). Research in this area has grown exponentially in the past five to ten years, focusing on the challenges of implementation, the benefits for students, and best design practices. The focus has been pragmatic – what works, what does not, and if this pedagogy develops the promised skills (intercultural, language or digital skills) in students (Chun, 2015; Çiftçi & Savaş, 2018; Helm & Acconcia, 2019). VE can be considered part of the larger Technology Enhanced Learning (TEL) field, since it is a methodology that uses technology to mediate learning experiences. As such, a common critique of the TEL field in general can also apply to this niche field – the lack of theory application and development (Bennett & Oliver, 2011). As VE is a multidisciplinary field, with roots in unrelated disciplines (e.g. language learning, pre-service teacher training, business, and engineering), a look at which theoretical underpinnings carry across from the various disciplines and how they are applied in research is important as this field matures, since these underpinnings shape how and what is observed and researched. An understanding of which theoretical underpinnings are employed in VE research can contribute to the creation of a cohesive body of literature.

This study aims to review qualitative and mixed-methods research on VEs in HE to examine what and how existing theoretical underpinnings are applied. The first section defines what is VE and discusses previous literature reviews on VEs to demonstrate the need for a review on theoretical underpinnings in VE. The next section defines theoretical underpinnings and their importance in research. Then the research questions and methodology are presented, followed by the results, discussion, and conclusion.

2.   VE literature reviews

For this study, I define VEs as "sustained, technology-enabled, people-to-people education programs or activities in which constructive communication and interaction takes place between individuals or groups who are geographically separated and/or from different cultural backgrounds, with the support of educators or facilitators" (EVOLVE, 2020). While other terms exist to describe this or similar practices, VE has become the umbrella term of choice for European policies and projects, such as EVOLVE and EVALUATE, and therefore I adapted it for this study. Other common terms reflect the discipline origins (e.g. telecollaboration for language learning) or the country origin (e.g. collaborative online intercultural learning from the US). VE research

has exploded over the last decade across disciplines, mirroring the rapid development of web 2.0 technologies that has enhanced the ease of and access to instant communication across the globe (Zak, 2021).

A number of recent academic papers have summarized this growing body of literature, each highlighting a different aspect of the VE field. A majority have mentioned the most common perceived benefits of VE (increased intercultural, language, and digital competences) and perceived challenges of VEs (e.g. didactic, technology, and organizational barriers, Alvarez & Steiner, 2019; Chun, 2015; Çiftçi & Savaş, 2018; Helm, 2015; Luo & Gui, 2019; Zak, 2021). Some consider trends and developments in VE practice, such as increased use of a lingua franca in transnational exchanges instead of bilateral exchanges (O'Dowd, 2016), the development of VE networks for identifying possible partners and exchanges of best practices (Luo & Yang, 2018), and the evolution of VE course design and pedagogy (Chun, 2015; Dooly & Vinagre, 2021; Zak, 2021). Criticisms of current VE practice include the potential of superficial or failed intercultural interactions due to poorly designed tasks (Çiftçi & Savaş, 2018; Luo & Yang, 2018), and the superficial assessment of intercultural competences (Dooly & Vinagre, 2021). Overall, the reviews on VEs focused on practice, not on research design. Zak's (2021) integrative review of VE concepts and trends briefly highlighted the over-reliance in VE research on qualitative case studies that focus on one VE course at one moment in time, leaving little room for comparisons or generalizations. Only Chun's (2015) overview on telecollaboration discussed "the ways of researching the design, development, and use of telecollaboration" (p. 6), focusing on common theoretical perspectives and methods used in telecollaboration research. While Chun's review provided an outline of research methods used in VE research, it was not a systematic review, it was focused only on language learning VEs and it was published before the recent explosion in VE course development and research fueled by large scale initiatives and projects, such as UNICollaboration founded in 2018 (O'Dowd, 2021a), EVALUATE founded in 2017 (Baroni et al., 2019), and EVOLVE founded in 2018 (Jager et al., 2019). The goal of this study is to expand on Chun's (2015) review by exploring which theoretical underpinnings are used in VE research and how they are applied.

3. Theoretical underpinnings

Before presenting the research questions that guided this study, I need to define the term 'theoretical underpinnings' and explain why I chose it. Theoretical underpinnings (Passey, 2019) describes any theory, theoretical framework, conceptual framework, or model used in research. This term was chosen instead of theory since much of the work in VE and in TEL in general is based on models or concepts but not specifically on grand theories.

A main critique of the TEL field has been the lack of critical use of theoretical underpinnings in research. Bennett and Oliver (2011) argued that the field of TEL has been overly focused on pragmatics and less on using theoretical underpinnings, which leads to contextually and time bounded, descriptive case study research that is difficult to generalize or apply to different contexts. Another critique of the use of theoretical underpinnings in TEL is the lack of seriousness and consistency in the application of theory in research (Bennett & Oliver, 2011; Passey, 2019). The analysis of 503 empirical research papers (qualitative, quantitative, and mixed-methods) by Hew et al. (2019) supported these criticisms by showing that only 35% of the papers explicitly used theory and only 15% advanced it. Critics argue that TEL research should move beyond just applying theory (if at all) to engaging with its development and find ways to expand to new audiences. Since VE can be considered a subset of the TEL field due to its use of technology to enable collaborative learning between students from different geographical and cultural locations, these critiques can also be extended to the VE field.

These criticisms lead to the question of why theoretical underpinnings are important for empirical research. First, educational research (including TEL and VE) is based upon the observation of social situations. From a subjective or interpretive ontological perspective, observations are inherently interwoven with theoretical underpinnings since our understanding of the world is built on "our prior ideas and assumptions" (Maxwell & Mittapalli, 2008, p. 2). This means humans interpret the world through preconceived concepts, whether consciously or unconsciously. Researchers, by acknowledging that their observations are influenced by theoretical underpinnings, can increase the validity and reliability of research observations and findings. By deliberately choosing theoretical underpinnings, researchers limit bias and frame research design. However, researchers must acknowledge the limitations of theoretical underpinnings and carefully consider observations that contradict or do not fit with the underpinnings (Giroux, 2001; Passey, 2020). One method to avoid these limitations is to employ different theoretical underpinnings in the conceptualization and data analysis of research to create a 'discursive gap' – a gap between the theories and data which can lead to the interrogation of the data beyond one theory (Ashwin, 2012). This discursive gap can lead to the necessary criticality in data analysis to advance theoretical underpinning development. Finally, theoretical underpinnings "make the particular significant by locating it in broader trends, issues, and dynamic forces" (Trowler, 2019, p. 167). Since much of VE research is contextually bounded by nature, for example focusing on one or two small VEs, theoretical underpinnings can move a locally situated practice into a broader conversation using similar concepts, terminology, and research design.

For VE research to address this criticism of under-utilization of theoretical underpinnings in general TEL research, first an overview of theoretical underpinnings used in VE research is needed to

understand the current situation. The aim of this SLR is to provide this overview so that the VE field can purposefully develop theoretical underpinnings as it matures from a scattering of studies in various disciplines into a distinct field of research.

4.   Research questions (ENTREQ Guideline 1)

In this study, I focus on how theoretical underpinnings are used and applied in empirical research using qualitative and mixed method methodology in the VE field. The research questions that guided this study are as follows.

- Which theoretical underpinnings have been employed in VE research in HE from 2018-2021?
- How have theoretical underpinnings been applied in VE research in HE from 2018-2021 and how explicit has the application been?
- To what extent has VE research in HE from 2018-2021 contributed to the advancement of theoretical underpinnings?

5.   Methodology

5.1.   SLR methodology (ENTREQ Guideline 2)

I chose an SLR methodology to answer the research questions for this study. SLRs, especially in comparison to narrative literature reviews, offer transparent and standardized methods for collecting and analyzing evidence to answer specific research questions (Sharma, Gordon, Dharamsi, & Gibbs, 2015). In essence, SLR transforms the literature review process into empirical research with clear protocols that can be replicated. The healthcare field has pioneered standardized methods for SLR, such as PRISMA (Moher et al., 2009) for quantitative studies and ENTREQ (Tong et al., 2012) for mixed-methods and qualitative studies, which have been adapted by additional fields such as education (Acuyo, 2021). This SLR is a Qualitative Meta-Synthesis (QMS) due to the high number of qualitative and mixed method studies within the VE field (Zak, 2021) and the aim of this study – analyzing the use of theoretical underpinnings within VE research. QMS is a method that allows isolated, contextually bounded findings from qualitative research to be combined and interpreted to inform theory and research within a specific field (Finlayson & Dixon, 2008; Leary & Walker, 2018). This study follows the ENTREQ guidelines for reporting qualitative SLR to ensure transparency and reliability of the findings of this study (Tong et al., 2012) (Appendix 1).

5.2. Search strategies (ENTREQ guidelines 3-13)

I identified the literature for this study through a search conducted on Scopus using the following combination of keywords based on the terms compiled by O'Dowd (2016): 'virtual exchange OR collaborative online intercultural exchange OR online intercultural exchange OR virtual teams AND higher education'. Scopus was chosen for its comprehensive coverage of peer-articles required for a systematic review (Martín-Martín et al., 2021; Pranckutė, 2021). The initial inclusion criteria were peer-reviewed papers on VEs in HE from the years of 2018-2021. These criteria were chosen to narrow the focus on the recent explosion of VEs. 2018 was chosen as the beginning of the criteria period because this year marked the beginning of the EVOLVE project and UNICollaboration (O'Dowd, 2021a). The initial search yielded 153 articles. After reviewing the titles and abstracts of the 153 articles, another 56 articles were excluded for not meeting the inclusion criteria above or being non-empirical work (literature reviews or conceptual papers), leaving 97 articles. Since the aim of this paper is to review the theoretical underpinnings used in VE research across disciplines, it was decided to exclude papers that focused exclusively on language learning outcomes and theories to maintain the broader focus, reducing the number to 69 articles. After reading the 69 articles in full, 42 articles were selected according to the inclusion and exclusion categories described above, as well as the exclusion of quantitative articles or articles focusing only on graduate students (Appendix 2). I was the only one to review the potential articles; however, I consulted with an adviser and peers about the inclusion and exclusion criteria.

5.3. Analysis strategies (ENTREQ guidelines 14-19)

I used a matrix to extract data from the full text of the 42 studies selected (Klopper, Lubbe, & Rugbeer, 2007). The matrix categories included the expected parts of qualitative or mixed method research (e.g. research questions, findings), description of the VE design, and the theoretical underpinnings mentioned in the article (Appendix 3). Then ATLAS.ti software was used to analyze this matrix. Only I conducted the data extraction and coding; however, when I encountered a coding dilemma, I consulted the literature and my adviser before making a final decision.

To analyze the matrix, I adopted and expanded the coding scheme developed by Hew et al. (2019). In their literature review on the use of theory in educational technology research, Hew et al. (2019) developed a coding scheme to analyze the explicitness of theory use in research, how the theory was applied in the research design and if the research advanced theory (Table 1). First, Hew et al. (2019)defined three levels of explicitness of theory use based on Tight's (2004, p. 960) work:

- explicit: theory is clearly used, and one or more theories are explicitly identified;

- vague: theories are only vaguely identified, for example, an article utilized the 'self-efficacy scale' as a data collection instrument but did not explicitly identify or describe the theory underlying the self-efficacy constructs; and

- no evidence: the presentation and discussion of the study are devoid of any theory.

Table 1.   Coding scheme adapted from Hew et al. (2019)

Category	Remark/Code	Definition or example
Theoretical underpinning	Extracted from the study	For example: TPACK, intercultural competencies, experiential learning
Theoretical underpinning explicitness in research design	Explicit	Theoretical underpinning clearly used, and one or more theories are explicitly identified
	Vague	Theories are only vaguely identified or applied
	Little to no evidence	Study is devoid of any theory or only the barest of mentions
Theoretical underpinning explicitness in VE design	Explicit	Theoretical underpinning clearly used, and one or more theories are explicitly identified to create the VE
	Vague	Theories are only vaguely identified or applied to create the VE design
	Little to no evidence	No theory was mentioned concerning the VE design
Theory application (yes/no)	Conceptualization of research	For example, using TPACK to develop the research purpose or questions
	Informing data collection and/or analysis	For example, using a survey to measure students' TPACK
	Discussion of research findings	For example, using TPACK to explain or explore the findings
Theoretical underpinning advancement (yes/no)	Do the findings help us learn something new about a particular theoretical underpinning?	For example, do the findings add or subtract factors or elements from a theoretical underpinning?

Then, to examine how theory was applied in research, Hew et al. created three dichotomous coding subcategories of theory application based on Ashwin's (2012) work on categorization of theory use: conceptualization of research objective, collection and analysis of data, and discussion of research outcomes. Finally, Hew et al. (2019) developed the dichotomous coding category of theory advancement which asked if the research findings led to the discovery of something new about a theory. I used these three categories to inductively analyze the data extracted from the selected 42 studies. While coding, I realized that Hew et al.'s (2019) coding scheme missed an important element in the application of theory in VE research, the application of theory for the design of the VE, not the research design. Therefore, I added an additional coding category to the coding scheme: theory application in VE design. During the coding of the matrix, I referred to the original full text of the studies as needed to clarify understanding.

6.   Findings (ENTREQ Guideline 20-21)

In this section, I first provide a descriptive overview of the articles reviewed before presenting the findings that answer the research questions.

6.1.   Descriptive overview of studies

Forty-five percent (n=19) of the studies were from the pre-service teaching field, especially pre-service language teachers, 19% (n=8) from language learning, 14.3% (n=6) from business, and 21.4% (n=9) from various or unstated fields. This reflects the development of VE across a variety of disciplines, with most of the research and practice conducted in the first three fields mentioned. It is important to note that during the selection phase, many studies from the business and engineering fields were excluded since they were quantitative.

The collaborative nature of VE seemed to permeate to the research teams, with four teams of researchers writing two or more articles together (Lenkaitis, Loranc-Paszylk and Hiliker, Rienties, Lewis and Rets, Swartz, Barbosa and Crawford, and Sardegna and Dugartsyrenova). Moreover, Lenkaitis authored or co-authored six articles included in this review, which might have skewed the findings toward her areas of interest: global citizenship and intercultural competencies.

6.2.   Theoretical underpinnings categories

The first research question asked which theoretical underpinnings were employed in VE research. Sixty-nine different theoretical underpinnings were mentioned, reflecting that many studies used two or more theoretical underpinnings to guide the research or VE design. I divided the theoretical underpinnings used in the studies into five broad categories: pedagogical, intercultural competencies, digital literacy, psychological and socio-cultural, and other (Table 2). The largest category was pedagogical theoretical underpinnings (46%, n=32), which I further divided into three subcategories: learning approaches (how to design learning experiences, n=18), learning theories (how learners learn, n=11), and teaching approaches/competencies (strategies and skills teachers need to mentor students, n=3). The learning approaches subcategory was the largest subcategory, more than double the next largest one.

The second largest category was intercultural competences, with 29% (N=20) of the articles mentioning at least one of eight different models or frameworks for intercultural competencies or global citizenship. Six studies used digital literacy underpinnings and five studies used psychological and socio-cultural underpinnings. The last category included theoretical underpinnings that did

not fit into the above-mentioned categories nor could be combined into a cohesive category. These underpinnings ranged from discipline specific underpinnings, e.g. linguistic theories, to general concepts, e.g. internationalization at home. It is important to note that this list attempted to include all mentions of theoretical underpinnings in the studies in the review but did not note how extensively or explicitly the theoretical underpinnings were applied. Some of the theoretical underpinnings were briefly mentioned while others were extensively described and applied to the research design and/or the VE design. The findings for second and third research questions will consider this issue in more detail.

Table 2. Theoretical underpinning categories

Category	n	Example
Pedagogical	32 (46%)	
• Learning Approaches	• 18	• Guided reflection (Flowers, Kelsen, & Cvitkovic, 2019)
• Learning Theories	• 11	• Critical incident Technique (Fuchs, 2019)
• Teaching Approaches/ Competencies	• 3	• Experimental learning (Abdulmuhsin & Tarhini, 2021; Rauer et al., 2021)
		• Social constructivism (Andujar & Medina-López, 2019)
		• Telecollaborative competencies for teachers (Grau & Turula, 2019)
Intercultural Competencies	20 (%29)	• Global citizenship model (Lenkaitis & Loranc-Paszylk, 2021)
		• AACU&U value rubric (Sardegna & Dugartsyrenova, 2021)
Digital Literacy	6 (%8.7)	• TPACK (Bueno-Alastuey, Villarreal, García, & Esteban, 2018)
Psychological and Socio-Cultural	5 (%7.3)	• Cultural historical activity theory (Nishio, Fujikake, & Osawa, 2020)
		• Cultures of use (Fuchs, 2019)
Other	6 (%9.7)	• Native speaker fallacy (Viáfara González, 2020)
		• Third space (Jørgensen, Mason, Pedersen, & Harrison, 2020)

6.3. Theoretical underpinnings utilization

In this section, I answer the second research question: how theoretical underpinnings were applied to VE research and how explicit was the application. To answer this question, it is easier to discuss first how explicit the application of theoretical underpinnings and then explain where the application occurred. Twenty articles (47.6%) had explicit use of theoretical underpinnings in research design and another 14 articles (33.3%) had vague use of theoretical underpinnings (Table 3). The articles that used explicit theoretical underpinnings were consistent in applying theoretical underpinnings in all three sections of the research design: conceptualization, data

collection and analysis, and discussion of results. What differentiated studies with vague use of theoretical underpinnings was the inconsistency in applying theoretical underpinnings throughout all sections of research design, where theoretical underpinnings appeared in only two out of the three sections, usually in the conceptualization and discussion. The articles with little to no evidence of theoretical underpinnings (19%, N=8) did not use theoretical underpinnings in almost any of the three sections.

Table 3.   Summary of reviewed articles (n=42)

	Explicit	Vague	Little to no evidence
Number of studies (n=42)	20 (47.6%)	14 (33.3%)	8 (19%)
Conceptualization			
Yes (n=31)	20 (47.6%)	10 (23.8%)	1 (2.4)
No (n=11)	0	4 (9.5%)	7 (16.7%)
Data collection and analysis			
Yes (n=23)	18 (42.85%)	4 (9.5%)	1 (2.4)
No (n=19)	2 (4.8%)	10 (23.8%)	7 (16.7%)
Research outcomes discussion			
Yes (n=30)	20 (47.6%)	10 (23.8%)	0
No n=12)	0	4 (9.5%)	8 (19%)
Advancement			
Yes (n=0)	0	0	0
No (n=42)	20 (47.6%)	14 (33.3%)	8 (19%)
VE Design			
Explicit (n=14, 33.3%)	9 (21.4%)	4 (9.5%)	1 (2.4)
Vague (n=13, 31%)	5 (11.9%)	5 (11.9%)	3 (7.1)
None (n=15, 35.7%)	7 (16.7%)	4 (9.5%)	4 (9.5%)
VE Advancement			
Yes (n=2) (practice, not theory)	2 (4.8%)	0	0
No (n=40)	1 (26%)	13 (31%)	16 (38%)

As discussed in the methodology section, during data analysis, I realized several articles used theoretical underpinnings to design the VE but not necessarily for research design. Thirty-one percent of the articles (N=13) had explicit theoretical underpinnings used in the VE design and another 31% had vague theoretical underpinnings used in VE design. While there is some overlap between articles that had both explicit use of theoretical underpinnings in VE design and research design, it was not a direct correlation (Table 3). Articles that had explicit theoretical underpinning

usage in both VE design and research design typically focused on one VE course. Articles which explicitly applied theoretical underpinnings in research design but not in VE design usually analyzed a large number of VEs using different course designs (O'Dowd, 2021b; Rienties et al., 2020) or focused on specific characteristics or skills developed by VEs but not on the pedagogical design (Swartz, Barbosa, & Crawford, 2020).

Figure 1. Article distribution (n) of methodology based on theoretical underpinning usage
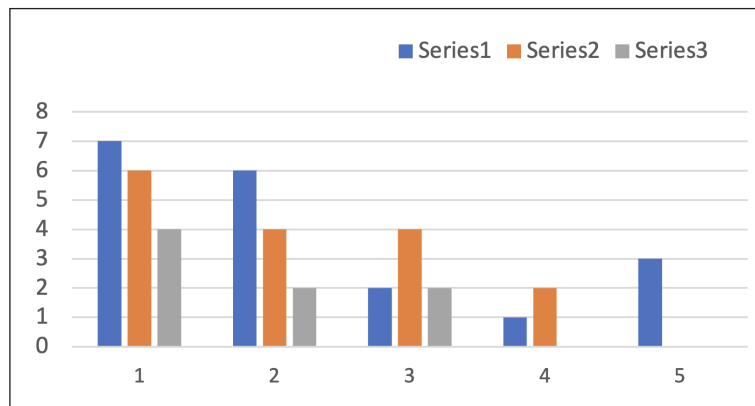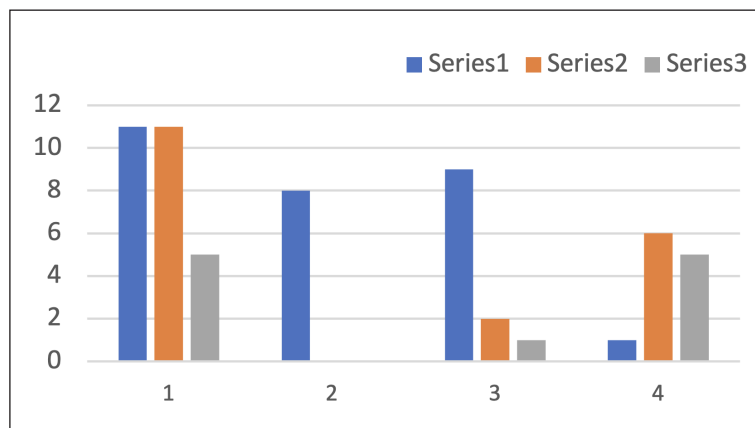

Figure 2. Article distribution (n) of data analysis methods based on theoretical underpinning usage

A wide range of methodologies were employed in the studies. The most common methodology described was mixed-methods followed by a lack of explicit methodology (Figure 1). Only a small number specifically reported using case study, ethnographic, or quasi-experimental methodologies.

The studies that explicitly used theoretical underpinnings were much more definitive in the type of methodology used as well as the description of data analysis. These studies also were more likely to use a pre-existing survey from the literature to collect qualitative and quantitative data and used deductive coding based on the theoretical underpinnings (Figure 2). The studies that had vague or no evidence of theoretical underpinning were more likely to use surveys specifically created for their project or provided limited details about the survey and they also relied more on inductive coding approaches.

6.4. (Lack of) advancement of theoretical underpinnings

The third research question asked to what extent the VE studies contributed to the development or advancement of theoretical underpinnings (Table 3). All the studies that explicitly used theoretical underpinnings in research design did not attempt to advance theoretical underpinnings. Instead, theoretical underpinnings were used to create a methodological research framework to ask and answer research questions. Similarly, only two studies advanced VE design practices, but none advanced VE design theory (Table 3). For example, Sardegna and Dugartsyrenova (2021) provided guidelines for developing discussion topics to increase intercultural competencies. Overall, the studies confirmed the use of the various underpinnings as tools for research or VE design.

7. Discussion

In this discussion, I return to the research questions guiding this systematic review to place the findings within the broader literature conversation about theory in TEL and HE research. The first research question inquired what theories were used in VE research. As described in the findings, I divided the 69 different theoretical underpinnings mentioned in the 42 studies into five main categories. Several theoretical underpinnings were mentioned by more than one paper, such as TPACK or intercultural competencies. This large variety of theoretical underpinnings indicates two trends in theory usage: the usage of theoretical underpinnings from various fields to explore VE, not just education, and the usage of more than one theoretical underpinning in research. Both Tight (2004) and Hew et al. (2019) also reported a variety of theoretical underpinnings used in HE and educational technology respectively, exemplifying how education research in general and within the more specific subfields (e.g. TEL and VE) borrow theoretical underpinnings from other disciplines, such as sociology, psychology, and computer science (Jones & Czerniewicz, 2011). This variety could present an opportunity for the advancement of theoretical underpinnings since the use of diverse perspectives can allow new observations that lead to new theoretical understanding, i.e. the opportunity to create the 'discursive gap' that leads to theoretical advancement (Ashwin, 2012).

Additionally, the use of theoretical underpinnings from other disciplines potentially creates a wider audience for VE and educational research (Bennett & Oliver, 2011). On the other hand, such a wide variety may prevent the development of a "metalanguage" and "coherent theoretical frameworks" for educational research in general and VE research specifically (Jones & Czerniewicz, 2011, p. 173). The use of multiple theories might also reflect a lack of explicit theoretical use, where researchers mention a variety of theoretical underpinnings connected to their research topic but do not explicitly explain which ones guided their research (Ashwin, 2012). This type of multiple theoretical underpinnings usage was not systematically coded in this review since it was beyond the scope of the research questions but is reflected in the studies marked as having vague theoretical underpinnings' usage.

Despite the large number of theories, many theoretical underpinnings fit into the broad category of pedagogy (46%). Similarly, Tight (2004, 2019) found that pedagogical research was one of the most popular categories of educational research, specifically course design and teaching and learning. These two subcategories correspond with the three subcategories of this review: learning approaches, learning theories, and teaching approaches respectively. Therefore, VE research seems to follow the trends of broader education research. Moreover, the use of pedagogical theoretical underpinnings in VE research, especially learning approaches for course design, reflect how VE is an educational practice designed to achieve specific learning outcomes, or in other words, VE is a "powerful pedagogical practice" (O'Dowd, 2021b, p. 222). The VE field has moved beyond asking if VE works as a pedagogy to asking which learning approaches best deliver the desired student outcomes within this broad pedagogy, as reflected in the number of pedagogical underpinnings used in the review articles (O'Dowd, 2021b).

The next three categories of theoretical underpinnings, intercultural competencies, digital literacy, and psychological and socio-cultural underpinnings mirror three of the most common desired student outcomes of VE: improved intercultural competencies, digital skills, and soft skills (Barbosa & Ferreira-Lopes, 2021; O'Dowd, 2021a). Since the definition of VE emphasizes the use of digital tools for communication and collaboration between students from culturally different backgrounds, it would be expected that research on VE would focus on these three skills. Intercultural competencies was the largest by far of these three underpinning categories, echoing the literature on the central role of intercultural competencies as a research trend and learning outcome for VEs (Barbosa & Ferreira-Lopes, 2021; Zak, 2021). The number of various theoretical underpinnings used to describe or measure intercultural competencies demonstrates the complexity of this skill and the difficulty in effectively and accurately measuring it (Deardorff, 2006; Dooly & Vinagre, 2021).

My second research question asked about how theoretical underpinnings were applied to VE research and how explicit was the application. Based on my review of 42 studies, 47.6% of studies had explicit engagement with theoretical underpinnings and another 33.3% had vague engagement. This contributes to an encouraging trend in education and TEL research: increased engagement with theoretical underpinnings in research. Early literature (Ashwin, 2012; Tight, 2004) demonstrated that a large proportion of studies completely lacked engagement with theory, which contributed to the criticism about the atheoretical nature of education research, especially TEL (Bennett & Oliver, 2011; Tight, 2004). Hew et al. (2019) reported a larger number of studies engaging explicitly with theory, but still a minority. Hew et al. (2019) explained this finding as a sign of immaturity in the field of educational technology that reflects the pressure to focus on practice, not theory. While my results could be interpreted in the same light as a sign of immaturity and a focus on practice, I, in fact, view these findings as an initial sign of maturity in the TEL and VE research field, especially when taken from a historical perspective. My findings suggest the VE field seems to have heeded previous critiques of educational research and started to incorporate more theoretical underpinnings into research. The VE field seems to be following Chun's (2015) call for more use of theories and frameworks as it slowly matures.

Most of the articles that explicitly utilized theoretical underpinnings applied them in the conceptualization of research objectives, data collection and analysis, and discussion of results. However, none of the articles presented theoretical underpinnings advancements and only two provided practice development. This finding echoes previous literature reviews' findings that educational research focuses on theory exemplification, not theory advancement (Ashwin, 2012; Hew et al., 2019). This means using the same theoretical underpinnings to frame, analyze, and explain data but not to interrogate or advance the theory. While there is nothing wrong with theory exemplification, and it can even be a step in the right direction in ensuring high quality research by making theories explicit rather than implicit, it can lead to circular thinking where the theoretical underpinnings over-determine the interpretation of the results instead of the critical analysis of them. To encourage theoretical underpinnings' advancement, Ashwin advocated for creating a 'discursive gap' between theoretical underpinnings used in the conceptualization and those used in data analysis, i.e. consciously choosing two different theoretical underpinnings to create a space to interrogate not just the data but also the theoretical underpinnings. A focus on not just explicitly using theoretical underpinnings in research but also on the explicit creation of discursive gaps in research design could lead to more theoretical underpinning development in VE research.

Originally, I conceptualized this literature review to be an exemplification of theory, using Hew et al.'s (2019) coding scheme to examine the state of theoretical underpinnings' usage in VE. However, during the data analysis, I saw an opportunity to view and analyze the data in an alternative way,

realizing that theoretical underpinnings were also explicitly used in designing the VEs under study, but not necessarily in the research design. While Tight (2019) found course design to be a common topic of educational research, he did not differentiate between theoretically-based research on course design and theoretically-based course design as the site of research, but not the focus. While the complexity of educational research is generally recognized, especially with the emphasis on context with the adaption of socio-cultural approaches in HE practice and research (Jones & Czerniewicz, 2011), this specific layer of complexity in educational research has not been addressed by the literature I have reviewed.

8.   Conclusion

This study contributes to the ongoing discussion on theoretical underpinning use in TEL research by examining if the criticism that TEL research is an under-theorized field also applies to the niche field of VE research. The findings of this SRL show that almost half of the studies explicitly apply theoretical underpinnings throughout the research design. This finding on its own could be seen to validate this criticism of TEL research. However, when placed within an historical perspective of previous reviews of the state of theoretical usage in TEL and HE research, the findings point toward an increase in explicit use of theoretical underpinnings in TEL research. This finding, taken together with a move from research on small case studies of individual VEs to research on networks of VEs (Dovrat, 2020), demonstrates a maturing field moving from 'childhood' to 'adolescence'. I chose the word adolescence to emphasize that additional steps are still needed to become a mature research field, such as even wider use of theoretical underpinnings in VE research and contribution to theoretical underpinnings' advancement within and outside of VE.

Another finding from this SRL with implications for the VE field is the wide range of theoretical underpinnings mentioned in the 42 articles. This variety of theoretical underpinnings has the potential to lead to advancement in theoretical underpinnings if harnessed correctly for two specific reasons. Firstly, Ashwin (2012) argued for creating a discursive gap in research by using different theoretical underpinnings in the conceptualization and data analysis to encourage the interrogation of the data to lead to advancement in theoretical underpinnings, not just confirmation, or 'exemplification' of them. VE researchers can consciously choose two theoretical underpinnings in their research to purposely create this discursive gap. Secondly, Bennett and Oliver (2011) encouraged the use of theoretical underpinnings from fields outside of TEL in combination with TEL ones to increase the audience of TEL research and the chances of theory advancement. Since VE research already draws on theoretical underpinnings from multiple fields outside of TEL and education, the potential for a wider audience and theoretical advancement

is potentially large. To aid VE researchers in choosing distinct but complementary theoretical underpinnings for their research so it can reach full theoretical potential, further research could examine the specific forms or levels of theoretical underpinning use in VE research. This could be done by dividing the theoretical underpinnings into models, conceptual frameworks, theoretical frameworks, and theories (Passey, 2019) at high, mid, or low levels (Tight, 2004). The application of theoretical underpinnings in a more explicit and sophisticated manner in VE research may also address some of the criticism of the VE field, such as the superficial assessment of intercultural competencies (Dooly & Vinagre, 2021).

Another contribution of this study is the addition to the coding scheme developed by Hew et al. (2019) for reviewing theory use, application, and advancement in TEL research. This study found that theoretical underpinnings were not only used in the research design but also in the design of the VE courses under study. This finding demonstrates the broad cyclical connection between research and practice, with theoretical underpinnings developed by previous research influencing practice which in turn is investigated through more research. Both practitioners and researchers in VE should be encouraged to explicitly use theoretical underpinnings in designing VEs and the subsequent evaluation and research on these VEs to continue this cycle of practice and research in a purposeful manner. Additionally, this extra layer of complexity to theoretical underpinning usage could also be applied to other education research outside of VE research. Any research that examines a specific type of course or task can also examine or acknowledge how theoretical underpinnings influenced the design of the course or task, not just the research design.

Two limitations of this study must be acknowledged. Firstly, only one database was searched for articles. This means potential articles for inclusion could have been missed, despite the comprehensive nature of Scopus. Secondly, this SRL only reviewed the theoretical underpinning usage in qualitative and mixed-methods research, not quantitative studies. This might have skewed the representation of disciplines in this SRL toward social science and humanities disciplines (education, language learning) and away from business and science disciplines (business, engineering, and healthcare) since the latter leans toward quantitative research. Further research could include analyzing theoretical underpinning usage in quantitative studies in VE as well.

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Journal of Virtual Exchange (JVE) is an online, open-access, peer-reviewed journal aimed at practitioners and researchers in the field known variously as virtual exchange, telecollaboration, or online intercultural exchange. It is the official journal of UNICollaboration (https://www.UNICollaboration.org/), the international academic organisation dedicated to supporting and promoting telecollaboration and virtual exchange in higher-level education.

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1. Appendix 1: ENTREQ Checklist (Tong et al., 2012)

Item No.	Guide and Description
1. Aim	State the research question the synthesis addresses
2. Synthesis methodology	Identify the synthesis methodology or theoretical framework which underpins the synthesis, and describe the rationale for choice of methodology (e.g. meta-ethnography, thematic synthesis, critical interpretive synthesis, grounded theory synthesis, realist synthesis, meta-aggregation, meta-study, framework synthesis)
3. Approach to searching	Indicate whether the search was pre-planned (comprehensive search strategies to seek all available studies) or iterative (to seek all available concepts until they theoretical saturation is achieved)
4. Inclusion criteria	Specify the inclusion/exclusion criteria (e.g. in terms of population, language, year limits, type of publication, study type)
5. Data sources	Describe the information sources used (e.g. electronic databases (MEDLINE, EMBASE, CINAHL, psycINFO), grey literature databases (digital thesis, policy reports), relevant organisational websites, experts, information specialists, generic web searches (Google Scholar) hand searching, reference lists) and when the searches conducted; provide the rationale for using the data sources
6. Electronic Search strategy	Describe the literature search (e.g. provide electronic search strategies with population terms, clinical or health topic terms, experiential or social phenomena related terms, filters for qualitative research, and search limits)
7. Study screening methods	Describe the process of study screening and sifting (e.g. title, abstract and full text review, number of independent reviewers who screened studies)
8. Study characteristics	Present the characteristics of the included studies (e.g. year of publication, country, population, number of participants, data collection, methodology, analysis, research questions)
9. Study selection results	Identify the number of studies screened and provide reasons for study exclusion (e.g. for comprehensive searching, provide numbers of studies screened and reasons for exclusion indicated in a figure/flowchart; for iterative searching describe reasons for study exclusion and inclusion based on modifications to the research question and/or contribution to theory development)
10. Rationale for appraisal	Describe the rationale and approach used to appraise the included studies or selected findings (e.g. assessment of conduct (validity and robustness), assessment of reporting (transparency), assessment of content and utility of the findings)
11. Appraisal items	State the tools, frameworks and criteria used to appraise the studies or selected findings (e.g. Existing tools: CASP, QARI, COREQ, Mays and Pope [25]; reviewer developed tools; describe the domains assessed: research team, study design, data analysis and interpretations, reporting)
12. Appraisal process	Indicate whether the appraisal was conducted independently by more than one reviewer and if consensus was required

13. Appraisal results	Present results of the quality assessment and indicate which articles, if any, were weighted/excluded based on the assessment and give the rationale
14. Data extraction	Indicate which sections of the primary studies were analysed and how were the data extracted from the primary studies? (e.g. all text under the headings "results /conclusions" were extracted electronically and entered into a computer software)
15. Software	State the computer software used, if any
16. Number of reviewers	Identify who was involved in coding and analysis
17. Coding	Describe the process for coding of data (e.g. line by line coding to search for concepts)
18. Study comparison	Describe how were comparisons made within and across studies (e.g. subsequent studies were coded into pre-existing concepts, and new concepts were created when deemed necessary)
19. Derivation of themes	Explain whether the process of deriving the themes or constructs was inductive or deductive
20. Quotations	Provide quotations from the primary studies to illustrate themes/constructs, and identify whether the quotations were participant quotations of the author's interpretation
21. Synthesis output	Present rich, compelling and useful results that go beyond a summary of the primary studies (e.g. new interpretation, models of evidence, conceptual models, analytical framework, development of a new theory or construct)

2. Appendix 2: Reviewed Articles

Aristizábal, J. C., & Welch, P. M. (2017). Promoting Intercultural Competence Through Student-driven Online Intercultural Exchanges. *Hispania*, *100*(2), 225-238. https://www-jstor-org.ezproxy.lancs.ac.uk/stable/26387776

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3. Appendix 3: Matrix for data collection

	Article 1	Article 2
Authors' Name		
Article Title		
Year		
Research Aim		
Research Questions		
Number of students (in VE and participating in research)		
VE Design		
Countries involved		
Discipline		
Theoretical underpinnings		
Methodology		
Results		
Discussion		
Where theoretical underpinning applied? Aim/RQs/Data analysis/Findings/Discussion?		