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Action research in education: a set of case studies?

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The present work provides a review of two widely used approaches in educational research: action research and case study. Action research aims to improve educational practice by means of reflective cycles and shows variants according to a predominant paradigm, from technical to critical visions. A case study, described as an umbrella term, focuses on understanding classroom situations in real contexts. Although it seems that the defining characteristics of the case study are common among different authors, there are numerous classifications, which sometimes overlap. Based on a review of the ideas forming the main cornerstones of these two research types, we have analysed their common points and differences and considered the methodological possibility of relating both approaches in educational research projects taking place in non-controllable situations. In the present work, two joint approaches are proposed: action research as collective case study and action research as a set of case study. The possibilities and limitations of both methodological perspectives are also discussed.

Keywords: educational review; research in real context; methodology; action research; case studies

Introduction

The personal and interpersonal meaning of some words can gradually change. Other words coexist with multiple meanings that can each be updated, changed and become more complex as time passes. This fact can be observed in many situations in research on education and was our finding when we decided to analyse what a case study is in more detail.

Merriam (2009) defines a case study as a research methodology in which both qualitative and quantitative strategies can be used. However, Yin (2014) interprets it as a method on some occasions and as research on others. Simons (2009) specifies that it is research integrating various methods. At the beginning of this author's book, she also criticises this situation: "In the literature on case study different authors refer to case study as a method, a strategy, an approach, and not always consistently" (2009, 5). We believe that this labelling problem can be solved by demonstrating the concept behind the terms we use. Action research is also questioned from the terminological point of view and both terms, research and action, are discussed depending on the educational stage where we intend to apply them. As Somekh and Zeichner (2009, 5) point out "we have both consistently resisted these pressures to call action research by another name, instead consciously using its discursive power". These authors also described "five 'variations' in the ways in which the global practice of action research has been localized in many part of the world" (p. 18). Variations include actions to promote greater social justice, school reforms and teacher development, to organise and support local action research communities and to improve teachers' practices. These variations suggested by Somekh and Zeichner are considered as indicative, since others could be identified, and their common feature is "the importance each demonstrates of working towards a resolution of the impetus for action with the reflective process of inquiry and knowledge generation, to generate new practices" (p. 18). In educational contexts, the reflective process typical of action research should allow to deepen the studied situations to obtain more socially just and productive outcomes. That is one of the reasons why we have decided to conduct a review about action research (referred to hereafter as AR), case study (hereafter CS) and the relationship between them.

Concerning the taxonomic debate on the definition of methodology, method, strategy and approach, we agree with the distinction Simons makes (2009). Specifically, approach refers to the methodological purpose and the research intention. For example, if we want to discover a cause–effect relationship, perhaps the most appropriate option would be an explanatory approach (Yin 2014). This approach is determined by the reference framework we consider, in other words, our epistemological and ontological view, which, in turn leads to a model (Silverman 2005). Methodology involves the process we follow to provide an answer to research questions or to validate hypotheses, in other words, “the entire design of the research: the choice of paradigms, methods and tools or techniques to explore research questions and to create new knowledge” (Williamson 2018, 4). These strategies are planned in advance, which we call design, and they are scheduled. Nevertheless, some designs are flexible and can change as we interpret the data (Simons 2009). Lastly, we talk about techniques used in research as methods, such as observations and interviews. These methods, in keeping with the purpose of the research, can be qualitative (such as participant observation, interviews and field notes) or quantitative (use of questionnaires with a Likert scale or the quantification and sequencing of patterns in a classroom situation). Several authors (Hacking 2001, Shavelson 2003, Fendler 2006) discussed the assumption of generalisability in educational research and point out “the emergence of scientific approaches to studies that are not focused on generalisability” (Fendler 2006, 447). Hacking (2001, 262) introduces the Bayesian approach to these studies saying: “The Bayesian did not claim that premises give sound reasons for an inductive conclusion. Instead, it was claimed that there are sound reasons for modifying one’s opinions in the light of new evidence”. Shavelson et al. (2003, 26) point out that “design studies have

been characterized, with varying emphasis depending on the study, as iterative, process focused, interventionist, collaborative, multileveled, utility oriented, and theory driven”.

Based on this perspective, it seems that both AR and CS, the two research types we focus on in this study, would be determined by our research intention. In general, the purposes underlying these two research types are not exclusive: the aim of AR in education is, among others, to help teachers improve educational contexts (Elliott 1985 1991 2007, Latorre 2003, Chen, Huang, and Zeng 2018), while the aim of CS is in-depth understanding of a case in its context (Stake 1995, Merriam 2009, Simons 2009, Yin 2014). Can a problematic classroom situation, or one a teacher wishes to address, be improved without first being explored, described and/or understood? Would this then be AR formed by a case study or by several cases?

The selection of a research approach in a classroom context, in which teacher/researcher’s intention is to improve educational practice, can generate dilemmas such as those that we pose. As educational researchers we believe that this work can enable other teacher-researchers to better understand the boundaries and intersections between these two approaches, in a way that helps them to limit their future research in educational action contexts. To do so, first step involves exploring these two research types. Elements to consider include for each type of research: its origins, purposes, characteristics, classifications and forms of implementation. We try to show the reader some of the dilemmas and complementarities between AR and CS by referring to the relevant authors of both approaches. The second step is to show a possible solution to the intersections and/or complementarities between AR and CS in order to guide the reader who has this dilemma when conducting their classroom research.

Action research in education

There are currently several approaches in AR and ways in which it is planned and

organised. These variants stem from a variety of aspects that have arisen since the beginning of the 1940s (Lewin 1946). It is a form of research that was initially criticised in the United States (Sanford 1970), revisited in the United Kingdom during its curricular reform (Stenhouse 1975, Carr 2006) and that has been approached in several ways to date (Zeichner 2001). In the context of some European journals, AR has been viewed both positively and negatively (Romera 2014), and it has certainly been ‘labelled’ as such after dropping out of ‘fashion’. Reason and Bradbury (2008, 698) consider AR as “a family of approaches where different needs and interests will pull practitioners and participants in different ways”. These authors also point out revisioning our worldview, paradigm shift and changing knowledge as characteristics of action research. Tomal (2010, 10) in his book aimed at educators indicates that “action research is a systematic process of solving educational problems and making improvements”. This author does not consider AR as quantitative (e.g. experimental) or qualitative (e.g. case studies) research, but something different that has characteristics of both approaches.

Despite this changing complexity, we can consider two interrelated variants attending to the purposes of AR in the educational context. Firstly, improving practice and understanding of classroom phenomena at different educational levels that can serve to help others. Secondly, the professional development of teaching staff and the reflective movement (Zeichner 2001, Somekh and Zeichner 2009).

The first variant, more directly linked to improving practice, has been understood from a variety of perspectives (Latorre 2003, Newton and Burgess 2008):

- (1) Technical AR, whose purpose is to encourage efficient classroom practices. Experts in participation establish a methodological implementation with the teaching staff and involve them in some of the research phases. Elliott (1991)

differentiates between educational research and research on education. The former is defined as research into practices from the perspective of the participants' action. The latter is research conducted by those aiming to establish formal theories and who do not consider the educational action in its context. Technical AR is the strategy Lewin (1946) and then Corey (1953) followed, after acceptance of educational research and not research on education (Elliott, 1991), became more widespread, resurfaced in the 1980s in the United States and continues to this day (Zeichner 2001).

- (2) Practical AR, in which the teacher selects the research problems and is in control and may collaborate with experts. This is the British AR approach proposed by Stenhouse (1985) and Elliott (1991) in which practice is improved while participants in the process are made aware of this fact.
- (3) Critical AR, of which the Australians Carr and Kemmis (1986) are the main experts in this emancipatory approach whose end objective is for there to be political and social equity in schools (Kemmis, McTaggart, and Nixon 2015)

Concerning the second variant, Stenhouse (1985) compares the task of teaching with art, arguing that education is not instrumental or technical as it depends on the artist—teachers—and their interest in improving their art, which is why good professional training is important. Elliott (1991), his disciple, proposed using case studies with second-order AR. This author worked with practising professionals and trainees in action and reflective cycles as a strategy for their professional development. He accomplished this by reintroducing the knowledge in action concept posited by Schön (1983), in which he specified that professional knowledge comes from professional practice and is tacitly incorporated into the conceptual framework, which is why it is important to reflect to make this knowledge explicit. These ideas are also shared by Hopkins (1989) or Letich

and Day (2000), who understand AR as the type of research teachers conduct to become independent in their professional judgement. This variant, therefore, seems to focus on studying the reflective process of trainee teachers through second-order AR (Mena and Tillema 2006, Abou Baker El-Dib 2007, Hagevik, Aydeniz, and Rowell 2012).

This professional development and teacher reflection movement is also linked to Collaborative Action Research (CAR). CAR involves collaborative, inclusive and open network among teachers, researchers and/or teacher-researchers or other participants who share their knowledge through dialogue and collaboration. The aim of this network is not only to improve practice but also to help each other in order to transform classroom practice in particular and the society in general (Locke, Alcorn, O'Neill, 2013). Linked to an emancipatory point of view, CAR not only benefits for teachers (Mitchell, Reilly and Longue, 2009), but also promotes social justice (Sandreto, 2008). During the process of trying to improve educational practice through AR, it is undoubtedly a good idea for those involved to reflect on the results and to develop professionally (whether they are experts, generally university lecturers, teachers or even students) and both variants are linked as a result. Nevertheless, publications on this type of research predominantly focus on one of the two.

Given the variants and types we find in this kind of research, methods are also diverse. Ranging from the spiral model proposed by Lewin (1946) to the self-study approaches considered from the point of view of professional development by Zeichner (2001), they have undergone some slight modifications. From a general perspective, we could say that this is a spiral of cycles comprising planning, acting, observing and reflecting (Latorre 2003). It is interesting to focus on the phases proposed by Elliott (1978) in our approach to AR. These include both the practical and reflective levels, as

observed in Figure 1. In this model, Elliott (1991) specifies what happens in each of the cycles:

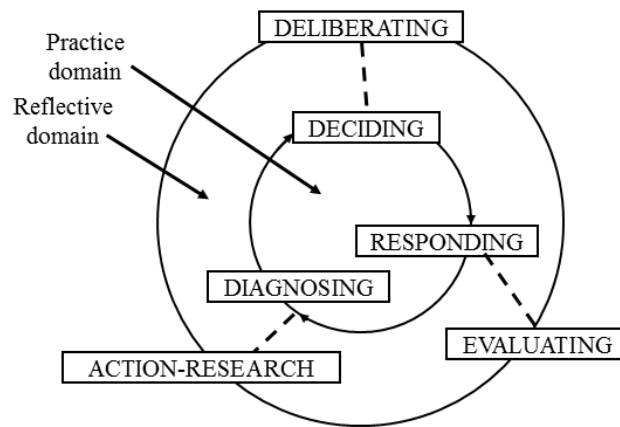


Figure 1. Cyclical model of AR (Elliott 1978)

- (1) Identify and clarify what we want to improve. This is a statement that refers to the general idea. The aspects to be improved are based on the teaching staff's experience and can be problematic situations that can be changed or that require a practical solution. They also require a series of prior considerations, such as the possibility of accessing the field of action, the desire for change and understanding the nature of the problem.
- (2) Recognition and review. Researchers need to describe the situation and the facts and produce explanatory hypotheses. In other words, they need to provide a precise description of what we want to change and an explanation for the possible origin of the 'problematic' facts and the context in which they arise.
- (3) Plan structure. Sometimes Elliott refers to AR as a type of project in which we have to consider the general idea (and bear it in mind), the negotiations we need to make and the resources we are going to require. He also emphasises the ethical considerations of the research.
- (4) Implement the action stages using methods that enable us to prove the results of the action and validate these results. He is not referring to validation as such, but

instead specifies that this means being thorough in the research using techniques that enable us to observe what happens from a variety of angles or viewpoints (Elliott 1991). In other words, through triangulation (Denzin 1978).

- (5) Review of the effects of the plan through a reflective process in which the action is stopped to adopt a more theoretical position. By explaining what is happening, a script is created, called case studies, which forms a theory presented in the language of common sense, which is then used to review and modify the general idea. At this point of an AR we can find ourselves with a methodological dilemma. AR and CS intersect and/or complement each other. How do we evaluate the action? Is it necessary to establish limits between the results of the action and the context? Is it necessary to select a research design for this? What strategies can we use? These questions are addressed in the next part of the present work.

When the effects of the improvement carried out are evaluated, another cycle of improvement starts again based on the interpretations of the first cycle. Elliott (1991) reintroduces Lewin's cyclical model with some modifications. Unlike Elliott, Lewin (1946) does not consider the general idea again cycle after cycle. Instead, he applies a change in one of the phases of his planning in each cycle. In contrast, Elliott specifies the need to constantly reintroduce the general idea, since the results could require a new practical action.

The action cycles continue until the proposed improvement is obtained. As achieving this improvement in just one cycle is very difficult, if it does happen, the next step would be to maintain it (Lewin 1946). Consequently, to answer the question on the spiral duration, Elliott (1991) says that no rules can be established. He believes at least three or perhaps four cycles need to be completed before we can be satisfied with the

improvements, and after completing one or two cycles, we could discover there is no possibility of improvement without other people's cooperation or intervention.

Nevertheless, classroom contexts change every year. In this case, can a change that has led to an improvement not lead to an improvement in the following cases in the following cycles? If the answer is yes, can we speak about AR? Could we perform action and reflection cycles with different students? In our opinion, they can be performed, although the improvement plans for the following cycles with different students would have to be adapted to this context, which involves introducing slight modifications that do not necessarily involve changing the general idea. AR generates knowledge of practical contexts (Elliott 1991) since its focus is generally qualitative; information is obtained that can be transferred to other contexts, naturalistic generalisations are made and our understanding constantly deepens.

Various methods are used in AR. Antecedents that began with this type of research preferred qualitative methods, partly because the reason for this type of research was the need to move away from more positivist approaches that failed to reflect actual classroom situations. This battle between qualitative and quantitative now appears to be over, since the instruments for collating information depend on the research purpose (Smith 2006).

Lastly, AR is based on practical needs and seeks to distance itself from theory, from an unreal educational situation. However, that does not mean that it ignores advances in research (in and on education). Evidence and its interpretation are also required to reflect on them because teachers who develop theories only from the reflection of experience, leaving aside past and present reflections, ends up inventing the wheel (Elliott 1978). "No other role in social science demands a broader spectrum of capacities, bridging practical problem-solving, reflective and analytical thinking than an action researcher" (Levin 2008, 669).

To sum up, AR analyses classroom situations that are experienced by teachers as problematic or subject to improvement. Its purpose is to explore in deep this problem in order to change it. To do so, cycles of action and reflection are carried out. This search of classroom situation improvement involves research in context and understand it, and this is no far from the aims of CS.

The case study in education research

The case study is exhaustive research from multiple perspectives of the complexity and uniqueness of a certain project, politician, institution, programme or system in a ‘real’ context. It is based on research, includes a variety of methods and is guided by tests. Its primary aim is to provide exhaustive understanding of a specific subject to generate knowledge and/or inform the development of policies, professional practice and civil or community action (Simons 2009). In other words, CS can be understood as a research approach that evaluates educational actions in a real context. Is that complementary to the review of action in AR?

Within educational research, CS was initially defined as a type of umbrella research (Martínez Bonafé 1988) that arose from the need to understand why some educational programmes work while others do not. Like AR, it needs to operate in real contexts and use qualitative techniques, since we cannot understand these situations with experimental techniques alone (Simons 2009). From our perspective, the challenge in CS research lies in differentiating the ‘case’ from the context in which it occurs, since the limits between them are very narrow (Yin 2014). Consequently, the case represents the phenomenon or the situation we want to explore, describe or explain, and the context represents the data external to the phenomenon, but which are necessary for the research to take place (Yin 2006).

Furthermore, one of the aspects that reference authors such as Stake (1998), Merriam (2009), Simons (2009) and Yin (2014) seem to agree on is the need to establish some limits and that the absence of these limits would mean that it could not be considered a CS since ‘a case’ forms a ‘closed’ system (Merriam 2009).

Some of the characteristics defining CS are: the importance of interpretation, seeking meanings (Stake 1995), asking ‘how’ or ‘why’ questions (Yin 2014), the absence of control over the research subjects’ behaviour (Stake 1995, Simons 2009, Yin 2014), the importance of the researcher’s reflexivity (Stake 1995, Simons 2009) and the diverse roles the researcher can play—teacher, assessor, interpreter—(Stake 1995).

Although there seems to be agreement on most of the elements defining a CS, slight variations can be observed attributed to how intentionally these authors use them. Stake (1995) established a classification of CS based on the kind of interest in the study subject. An intrinsic CS is based on an interest in understanding a specific situation and, therefore, both Stake (1995) and Simons (2009) seem interested in this type in their assessment, which has some similarities with AR. In contrast, an extrinsic or instrumental CS is based on an external issue (for example, other research projects) that fits in the CS research since it meets these characteristics. Another type of classification established by Stake (1994) considers the number of cases included within a CS. If there is more than one case, it is called a collective CS.

Yin (2014) seems to opt for an instrumental or extrinsic CS, even though he does not explicitly state this. Nevertheless, Yin (2014) does not consider this classification as he establishes three types of CS based on the case objective: 1) exploratory CS, in which situations are explored that are not clear from the research; 2) descriptive CS, in which a situation is described in its real context, either merely to know about it or to evaluate it; and 3) explanatory CS, in which the aim is to seek a cause–effect relationship between

complex situations. A differentiation based on the number of cases is used by Yin (2014) to select a design type within the CS. This author specifies single case design when a single “experiment” is studied, in other words, the research is conducted in one context, and multiple case design when it is conducted in other contexts to predict similar results (literal replication) or compare them (theoretical replication). From our perspective, this type of classification is not exclusive. If we conduct a research with several cases, it would be called a collective CS (Stake 1995) but not necessarily a multiple CS (Yin 2014) because that would require seeking the literal or theoretical replication. Yin (2014) also makes another distinction in design terms, classifying CS into holistic, when the case is studied as a whole, and embedded, when more than one research question is posed.

Another type of classification within CS is the evaluative type. Simons (2009) bases this CS type on the evaluation of educational programmes, perhaps with a more critical and emancipatory approach than Merriam’s (2009). Merriam views it as the description, evaluation and issue of opinions based on the case or cases. This design divisions seem to clarify what we aim to study in our research and how we go about it.

Depending on the type of design we select, there seems to be a differentiation in the role assumed by the researcher. Intrinsic CE is associated with an educational situation that one wants to understand from within (e.g., a teacher). This approach is closer to the ideas of Stake (1995) or Simons (2009). In contrast, extrinsic CE is associated with questions that come from outside the context (e.g., a research group or an educational institution), perhaps more instrumental. They are associated with Yin’s (2014) perspective. The number of research questions or the number of cases addressed may be variable, depending on the needs of the researcher in terms of understanding the case. According to Stake (1994) these questions may vary throughout the research, since their purpose is the search for meaning that is associated with the researcher's reflexivity. The

researcher has different roles: as a teacher who learns what the reader needs to know, as an advocate who describes the case with sufficient data, as an evaluator who pays attention to the merits and limitations of the research, as an interpreter who tries to illustrate the complexity of the case, among others.

Methodological strategies that the different reference authors in this work specify to conduct CS research follow a similar structure, although with slight variations:

- (1) Preliminary planning. This emphasises both knowledge of the case based on the literature (Simons 2009) and the asking of research questions (Yin 2014, Simons 2009) and, on the basis of them, the possibility of using CS as a way to perform the research (defined by how and why questions).
- (2) Choosing and outlining the case (Stake 1995), since we need to know the nature of the problem and outline it in its context (Simons 2009).
- (3) The case design, in which Yin (2014) specifies choosing among several types (exploratory, descriptive or explanatory), based on the study objective as a first step and then the design type (for example, single and embedded case design). The next step Yin proposes is how the data are to be collated and interpreted. In contrast, both Simons (2009) and Stake (1995) leave this phase more open and talk about flexible situations in which prefigured problems need to be addressed. However, the design can be changed if other problems surface later (Simons 2009).
- (4) Preparing data collation (Yin 2014) and obtaining access to the field (Stake 1998, Simons 2009). Yin (2014) recommends starting a pilot CS since it will provide information on the case's methodological issues.
- (5) Collating data using techniques such as interview, video and audio recordings, and so on. All the authors attribute a great deal of importance to collating data

from a variety of information sources (triangulation) and they also add other validation strategies depending on the type of CS in question. For example, Yin (2014) views internal and external construct validity, and reliability, as general criteria, and he uses one or the other depending on the CS in question; for Simons (2009), the criteria are credibility, transferability, reliability and confirmability.

In our approach, we agree with the validation strategies used by Simons (2009), taking Denzin (1978) as a reference. This author refers to four triangulation strategies as a form of precision in research: a) Investigator triangulation: several researchers analyse the data, an aspect that provides intersubjective reliability. b) Theory triangulation: results are studied in several reference frameworks. Therefore, the results are interpreted on the basis of the reference framework. c) Data source triangulation: using several tools to collate information to learn whether what we are studying means the same as when we observe it in another way. d) Method triangulation: using several analysis procedures, such as mixed strategies. Simons (2009) also adds other strategies, such as respondent validation, which considers participants' views on how exact, appropriate and impartial the researcher's observations are.

- (6) Data analysis followed by interpreting the data and spreading awareness of the case. While Yin (2014) specifies strategies, for example analysing time series or establishing relationships between patterns, Simons (2009) and Stake (1994) prefer to produce categories and code them using the constructivist grounded theory (Charmaz 2006).

Yin (2014) can be considered as more protocol-oriented, as he tries to group, classify and specify case studies as far as possible and, to a certain extent, make them similar to the structured approach of experimental or quasi-experimental designs (for

example, pre-test and post-test), although his approach lacks case control and its context. In contrast, Stake (1995) leaves the research more open, as does Simons (2009), and both mention study flexibility and the importance of the researcher's reflexivity. As can be observed, these are two very extreme approaches to CS.

We understand that the flexibility some of the above-mentioned authors refer to does not equate to chaos, to the absence of rigorous standards. Instead, they aim to show that problems can arise in real contexts when compiling data or even when analysing them. Consequently, in 'real' contexts, protocols and 'recipes' can be useful, but in the end, every researcher needs to find a way of conducting the research that suits their objectives and questions. Stake (1995) specifies that method books such as his own provide convictions, not recipes. Through experience and reflection, every researcher should seek the forms of analysis they find useful.

We consider that CS, from an intrinsic point of view, has many points in common with AR as the aim to provide exhaustive understandings about real educational situations or evaluate them or the reflexivity of the researcher. Therefore, AR and CS can complement each other and thus solve some of the problems or dilemmas in selecting AR as a research approach, as we propose below. In any case, there are other types of approaches that can be linked to AR. Randomised controlled trials are especially focused on outcomes and consequences, but not so much in the process involved in the implementation of an intervention. Some authors advise using process evaluation to complement these trials in AR, especially when working in complex areas dependent on the social context as Health Education (Oakley et al. 2006). Despite their differences, grounded theory approaches could be compatible with AR. Dick (2007, 398) indicates that "Grounded theory is more explicit about how theory is built from evidence. Action research might well emulate this. Action research is more explicit about how

understanding informs action, and sometimes collects and interprets information more efficiently”. This author emphasizes that grounded theorists and action researchers could obtain mutual benefits if understanding and utilizing each other’s approach.

Action research and Case Study two complementary approaches: A point of view in educational research contexts.

The combined AR-CS approach that we propose parts from a problem that we had as teacher-researchers when decided to carry out an AR. In our AR we wanted to know the learnings and difficulties of a group of pre-service teachers when they carried out activities that try to foster a reflective thinking. That is to say, we wanted to improve our teaching practice at the same time we reflected about the results obtained for future improvements. However, every academic year the kind of students changed, because teacher training courses (for secondary education teachers) take place only during a year. So, to solve this problem we decided to consider for each AR cycle a CS that allowed us to understand the learnings of each context.

It is important to say that CS embedded in AR is not a new approach. In fact, Elliott used CS from two perspectives: 1) as a means of studying AR conducted by groups of teachers taking Stake as a reference (see Elliott 1990) and 2) as a strategy to focus the drafting of each cycle of improvement within AR (see Elliott, 1991). In accordance with the latter perspective, AR, predominantly qualitative at the time, was based on Stake’s ideas (1995) as a means of understanding real contexts. While AR seeks two-fold improvement and change—of both the (teacher)-researcher and the research subjects—CS enables us to understand real phenomena. As we mentioned at the beginning of this paper, we believe these two objectives are not exclusive and, in fact, Elliott (1991) uses this as a way to ‘understand’ and ‘reflect’ on improvements of his general idea. Based on this idea, if every improvement cycle can be considered a CS, how far can CS be

considered a part of AR? How can we conduct AR with this approach? Would AR be considered a collective CS (Stake 1994) or would this be a case of several CSs?

Sáez and Carretero (1996, 45) indicate that “the conditions required for a teacher to produce a classroom case-study are not necessarily the same as those needed in order for an action research process to be carried out”. They also point out “that action research spirals may lead to the elaboration of classroom case-studies, that they constitute a condition that is necessary but not sufficient in itself” (45). These authors do not distinguish between types of CS or AR but they point to the challenge that these two perspectives pose.

As shown in previous pages, both the AR and CS approaches have a long and complex history. Both have common points that could be compared and complementary methodological aspects that can help us to have a better understanding of the educational improvement that we, as teacher-researchers, want to obtain. Table 1 compares the main elements of both approaches and their complementarities, which are developed below.

Table 1. Comparative summary between AR and CS approaches: features (F) and complementarities (C)

		Action Research	Case Study
Purposes	F	It improves educational practices. It generates knowledge from the action and reflection. It promotes professional development.	It provides exhaustive understanding about a real context. It allows the evaluation of educational contexts.
	C	The improvement of educational practices implies an understanding of the problem to be solved and an evaluation of the changes made to solve this problem that takes place in authentic contexts.	
Variants and researcher role	F	AR can be... (*) Technical: teacher in collaboration with researchers. Practical: teacher as a researcher who reflects on and in action. Critical: emancipatory approach that makes history (Kemmis 2010) *They all show a reflective and concerned teacher trying to understand and solve an educational problem. At the same time the teacher generates knowledge.	CS can be... (**) Intrinsic: the researcher wants to understand a situation/problem of his own. Comprehensive and reflective approach open to change. Closer to Stake's ideas. Extrinsic: external research questions. Instrumental and protocol approach. Closer to Yin's ideas. **Research designs also consider the number of cases and their contexts (single or collective CS) and the number of research questions (holistic or embedded CS).
	C	Interest in situational awareness, the reflective position of the researcher or openness to change are common elements between the intrinsic CS and AR that could make them complementary.	

Phases of research	F	1. Identifying and clarifying the change 2. Recognizing and reviewing of the problem 3. Structuring the plan to change 4. Implementing action research 5. Evaluating the action through reflection and starting a new action-reflection cycle	A. Preliminary planning: literature review and pose research questions. B. Choosing and establishing of boundaries between the case and the context. C. Designing the case D. Preparing data collation and collating data. E. Data analysis, interpretation and report writing.
	C	Points 1 and 2 of AR could be studied as a CS (points from A to E). This can provide a better initial understanding of the problem and therefore a better approach to improving it (point 3 and 4). Point 5 (evaluation of the action) could be examined by a new CS (points from A to E), which would allow not only a better understand of the change, but also to generate knowledge for teacher-researcher and educational community.	

If the objective is to improve a classroom situation and, for that purpose, a plan is designed and later analysed to discover the extent of that improvement, we would be talking about AR. Consequently, this would be a reflective process for the teachers and collaborators involved. First, we need to establish the limits of the problem and understand the initial situation. We could conduct a CS for that purpose. This involves outlining the context problem and planning each of the steps to follow to understand it. This necessary phase prior to AR helps us visualise the problem we are studying and could also lead to the general idea being modified. If outlining the problem results in ideas for changes, we also plan and design the phases involved and how to collate evidence that help us understand the reason for any change. As this is a new CS (or case), we might need to outline the context problem again, design a way to address the case and explore, describe in depth or try to explain our observations of the action. This involves a process of reflection followed by trying to understand the process of change. Consequently, we consider that AR, which deals with real contexts in which the problem to be researched is outlined and whose objective is to generate a change, is in fact a set of CSs (or a collective CS). From the first understanding phase of the problem (first case or CS) and from cycle to cycle, a series of CSs (or cases) appear focused on an improvement. Nevertheless, a CS does not necessarily have to be structured within AR, since its aim does not have to be an improvement. The opposite is also true; although the aim of the

research is linked to an improvement in educational practice, the limits between the problem and the context or the type of research questions asked to check this improvement, as they are not how or why type, are not structured within a CS.

From the point of view of the purpose of the research, we think that there are studies that could fit with the above-mentioned complementarities of AR-CS. For example, research that inform about a context, try to solve educational problems (case), involve collaboration and raise questions whose answers allow to understand the problematic situation making an effective synthesis that generates knowledge through reflection (declared or not). An example of this is the concern to link teaching and research (Millar and Osborne 2009; Blanco, Martínez-Peña and Jiménez-Liso 2018), which is reflected in researches focused on “design based research” (Psillos and Kariotoglou 2016), generally related to classroom improvements (micro or meso levels) or to general educational situations (macro levels) involving political, social and ethical aspects (Locke et al. 2013). If our research meets the criteria for using AR combined with CS, the next step is to think about the CS design we can use. Considering the role of the researcher, there is no doubt that it corresponds to an intrinsic CS, because the research problem begins with an educational situation that directly involves the researcher. But what can we do with the number of cases or the number of research questions? Stake (1994) called case studies comprising more than one case a collective CS. If AR can be structured within a CS, could we talk about a set of CSs or a set of cases (collective CS)? We believe, as happens with the relationship between AR and CS that depends on the type of AR in question. Elliott (1991) specified that every cycle within AR could be drafted in a CS format. A case needs its context to be understood and studied. Nevertheless, in AR each of the cycles is a changing context and a possible modification of what is to be changed. In other words, we could start with an AR cycle and, after

making a change for the purposes of improvement, we could discover problems behind this situation, which would make us change the aim of our improvement and, therefore, the study subject of the research. In this case, the next cycle would be a new CS, since the purpose of the research to understand the change would have been modified. We would then talk about a set of CSs (Figure 2, top). In contrast, if the aim of the improvement had the same purpose, we would talk of a single CS with several cases (collective CS). We could also suggest several research questions in each case or CS and take an embedded design as a reference (Yin 2014) (Figure 2, bottom).

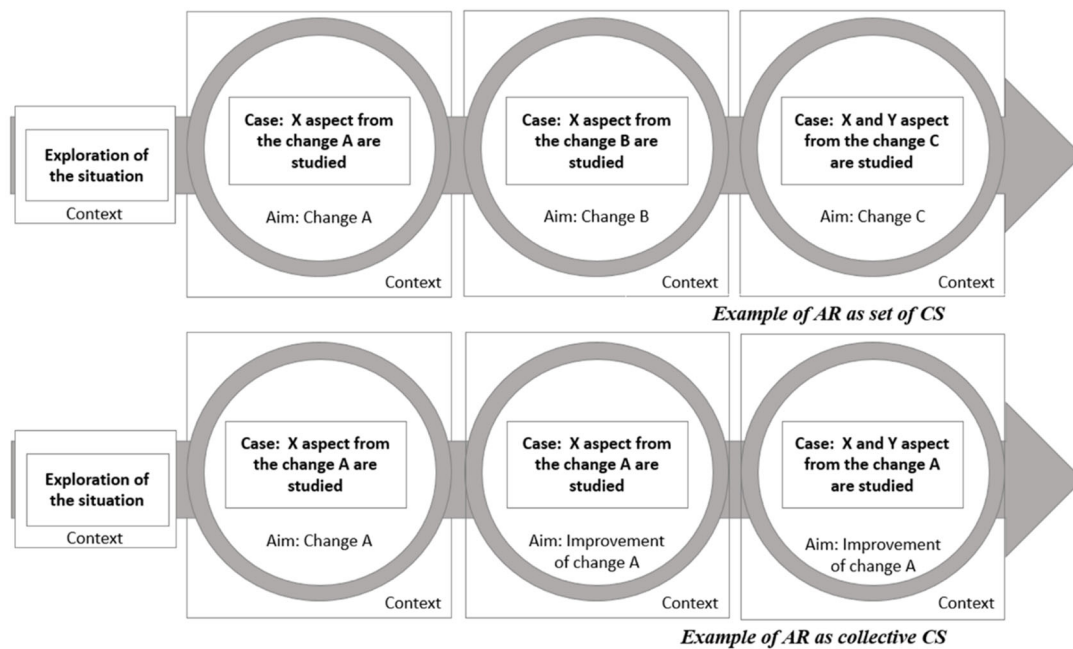


Figure 2. Examples of AR as collective CS and AR as a set of CS. Figures adapted from Lewin (1946), Elliott (1990) and Yin (2014).

As is shown in Figure 2, each of the circumferences represents an AR cycle. The rectangles represent cases and their contexts. The circle as a whole refers to the overall process giving rise to a CS (top figure) or one case (bottom figure). The arrow refers to time, which would include the reflection phase for the start of the next cycle. Consequently, before beginning the first cycle, we need to deepen our understanding of

the problem or the aspect to be improved. This phase prior to AR would be a CS and could be called a pilot CS (Yin 2014). The last circle of both images represents the possibility of proposing more than one research issue to discover the change (Yin's embedded design 2014). This image only shows a visual example of the idea we want to convey, since the possibilities are huge. In these examples, the top image is similar to the model proposed by Lewin (1946), while the bottom is more in keeping with Elliot's idea (1990) on action and reflection cycles.

Both approaches to combining AR and CS are present in AR papers, although not always explicitly identify as such. On the one hand, studies of "AR as a set of CS" are usually associated with an adaptation of AR in which participants move out after a cycle has been conducted (Bates, 2008; Authors, 2017). On the other hand "AR as a collective CS" is linked to a long-term research (at least one academic year) that cycle by cycle improves the same educational problem (Sáez and Carretero 1996; Wijesundera 2002). For example, Sáez and Carretero (1996) carried out a two-years AR with the aim of getting teachers to reflect critically on new technologies. To do so, they used classroom case studies as a methodological strategy to carry out the AR. In any case, these authors warned of the possible limitations of this methodological approach. They consider that conducting a CS not always involves an AR, because this requires a self-evaluation. Authors (2017) also found out as limitation the possibility of forgetting the aim of educational improvement because of trying to understand the case. Furthermore, this situation can, in turn, lead to an authentic context being transformed into a controlled educational situation under a research question. In this way, it is easy to fall in a feedback loop in which not only the purpose of the AR is lost, but also the meaning of using CS.

Based on this review, we can say that AR can comprise a set of CSs in some educational research contexts. This perspective could be a way of structuring research

conducted in real contexts aimed at educational improvements. Furthermore, considering AR as a set of CSs can help teachers and researchers address dilemmas in conducting action research (see Elliott 1991). From this perspective, we must not forget that the main objective of AR is to improve practice and that production and the use of knowledge stem from seeking this improvement and are conditioned by it (Elliott 1991). Nevertheless, to discover this improvement we need to use strategies to observe changes and, in turn, to generate knowledge of both the action and the use of the strategies and tools. This fact, which is cyclical as AR is, can lead to some confusion.

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