

A quasi-experimental study to explore the impact of PAR on becoming an Agile Warrior

Leon Berry¹, Bart Rienties^{2*}, Allison Littlejohn², Venkat Sastry³

¹ Army School of Education, Worthy Down Camp, Winchester, SO21 2RG, United Kingdom

**² Institute of Educational Technology, Open University UK, Milton Keynes, MK7 6 AA,
United Kingdom.**

**³ Applied Mathematics and Scientific Computing, Centre for Simulation and Analytics,
Cranfield University, Marlborough Hall 75, MH126, Cranfield, United Kingdom**

***Corresponding author: Bart.Rienties@open.ac.uk**

Abstract:

The Agile Warrior concept has been developed to promote thinking skills throughout all ranks in the British Army, including initial training during Phase 1. The concept of the Agile Warrior is based around transformation of learning and teaching in the Army from an instructor-led approach to a constructivist, student-led method. This transformation is facilitated through a process termed 'Present, Apply, Review' (PAR). The effectiveness of the PAR method to encourage recruits' motivation, self-regulation, and reflective thinking was tested in a quasi-experimental pre-post design by comparing 97 participants who were trained by PAR instructors with 115 participants who were trained by Non-PAR instructors. Subsequently 2*2*2 recruits were interviewed to interrogate the underlying reasons why PAR was effective for some, but not others.

The quantitative findings indicated no positive effect of PAR compared with Non-PAR instruction in terms of motivation, self-regulation, and reflective thinking. Follow-up semi-structured interviews indicated that a mix of pre-dispositions (e.g., physical ability), motivational climate (e.g., instructor) and learning factors (e.g., self-regulation) influenced the lived experiences of Phase 1 recruits, and PAR in particular. A recommendation is to expand the application of constructivist approaches to training within the Armed Forces, paying particular attention to the motivational climate of the learning environment and the learning factors and pre-dispositions of the learners. Further studies are needed to examine the impact of constructivist approaches to training within that context.

Keywords: Professional development; motivation; self-regulated learning; reflective thinkers; quasi-experimental design; mixed method

INTRODUCTION

The British Army is going through significant structural changes, affecting all facets of its operations. One effect of the economic recession of 2008 was a strategic defence and security review, published by the UK Government ([HM Government, 2010](#)), which outlined plans to restructure the British Army in terms of its Divisions, Brigades and Regiments. This review was also influenced by the changing nature of warfare and war strategy. While the fundamental nature of conflict remains the same, the operating environment has changed, requiring a rethink in tactics and deployment of personnel. As a consequence of this review, the composition of full-time soldiers was reduced from 102,000 to 82,000, while the number of part-time 'reservist' soldiers was increased to 30,000 ([HM Government, 2010](#)). By significantly changing the balance between full-time and part-time soldiers, the British Army had to reflect on how it develops its soldiers and instructors through its programmes of training ([Brooke-Holland & Thurley, 2014](#); [House of Commons, 2014](#)).

Military strategy and tactics evolved from a position where soldiers respond to orders to one where personnel have to make decisions in a variety of demanding environments ([HM Government, 2010](#); [Liddy, 2004](#)). A soldier could be deployed to a variety of countries, conducting different tasks such as helping with the Ebola crisis in Sierra Leone, or peace-keeping in Cyprus. Similar developments have been identified in the Australian ([Liddy, 2004](#)), Dutch ([Petrovic, van Stekelenburg, & Klandermans, 2018](#)), New Zealand ([Overdale & Gardner, 2012](#)), and US army ([Conway, 2008](#); [Landsberg et al., 2012](#); [Spain, Priest, & Murphy, 2012](#)). This means that army training worldwide can no longer be focused on producing personnel that simply follow orders to nurturing the development of people who can make the right decisions in an agile way under challenging circumstances. Recognising this need, the British Army has

reviewed personnel training in the form of Professional Development (PD) to support soldiers to become what has been termed an ‘Agile Warrior’ ([Liddy, 2004](#); [Muth, 2011](#)).

The Agile Warrior is a soldier who can make decisions for themselves, as opposed to waiting for orders from senior officers. This concept is based on the principle of ‘mission command’, where decision-making powers are devolved to front-line troops to enable them to take the initiative without having to wait for further orders. In order to develop Agile Warriors, the British Army decided they needed to upgrade and upskill the instructors who deliver training.

A large body of PD research has highlighted that effective instruction and coaching can have a positive impact on learners’ attitudes, behaviour, and cognition ([Author B, 2013a](#); [Hattie, 2009](#); [Stes, De Maeyer, Gijbels, & Van Petegem, 2012](#)). There is evidence that instructors play a critical role in motivating learners and creating a positive climate that supports learning ([Orvis, Horn, & Belanich, 2009](#); [Overdale & Gardner, 2012](#); [Stes et al., 2012](#)). Student-centred environments, where instructors can effectively encourage self-regulation ([Panadero, 2017](#); [Zimmerman, 2000](#)), and reflective thinking ([Kember et al., 2000](#)), have been shown to be particularly effective. However, implementing student-centred approaches in military settings is not yet common practice ([Landsberg et al., 2012](#); [Overdale & Gardner, 2012](#)), even though there is substantial support in other fields of research that student-centred approaches can be effective. In addition, several reviews of PD (e.g., [Author B, 2013a, 2015a](#); [Ebert-May et al., 2011](#); [Stes, Min-Leliveld, Gijbels, & Van Petegem, 2010](#)) and student-centred environments in army contexts ([Landsberg et al., 2012](#); [Spain et al., 2012](#)) have indicated that only a few studies have used robust (quasi)-experimental designs to

explore the potential positive or negative impacts of new, more student-centred, constructivist methods of learning.

This study investigates the transformation of Phase 1 Army training for new recruits from instructivist training to a student-centred, constructivist form of learning using the Present, Apply, Review (PAR) design intervention. In particular, we question whether and to what extent the PAR design intervention had a positive impact on recruits' motivation ([Pintrich & De Groot, 1990](#)), self-regulation ([Panadero, 2017](#); [Pintrich, 2003](#)), and reflective thinking ([Kember et al., 2000](#)) on Phase 1 recruits in comparison to those who followed the conventional Phase 1 training. The study compares and contrasts pre-post psychometric results from 212 recruits, then interrogates the lived experiences of 8 recruits through semi-structured, follow-up interviews.

AGILE WARRIOR: A PAR APPROACH

The reduction in full-time personnel in the British Army is being implemented through an infrastructure overhaul termed "Army 2020" ([House of Commons, 2014](#)). Multiple redundancies mean that the remaining soldiers have to take responsibility not only for their own roles but also for the work of others who have been made redundant and army units with a long and distinguished heritage are being amalgamated, forcing a high degree of change ([Brooke-Holland & Thurley, 2014](#)).

These changes escalate the requirement for training across the army. There is an urgent need to ensure personnel and teams have the right knowledge, skills, and attitude to succeed on current operations, to meet standing commitments, and to prepare for contingency operations. The Agile Warrior concept ([Liddy, 2004](#)) essentially states that soldiers of all ranks need to be better equipped to make effective decision-making,

relating their decisions to the overall strategic plan. This ability is particularly crucial for regular soldiers who are closest to combat situations and have to fire-fight with enemy forces, often with civilians close by. In these complex settings, soldiers need to be able to make informed decisions, rather than following orders without question from commanders who are removed from the context ([Author A, 2018](#)). An effective foundation for training that supports and encourages agile decision making must be established within Phase 1 training.

The current approach to Phase 1 training within the British Army is a blend of different approaches within a behaviourist, instructivist environment ([Author A, 2018](#)). This, underpinned by a constructivist instructional design, i.e., the preparation of resources and learning processes in order to facilitate recruits' learning through creation of meaning in their minds ([Spain et al., 2012](#); [van Merriënboer & Kirschner, 2007](#)), has been appropriate for effective training of large numbers of recruits, as done elsewhere ([Landsberg et al., 2012](#); [Overdale & Gardner, 2012](#)). To improve training delivery, the British Army recognises the need to transform from an instructivist to constructivist-based learning that encourages recruits to make informed decisions in an agile way in complex environmental settings.

Phase 1 training

Phase 1 training aims to transform civilians into professional soldiers by supporting them to develop basic soldiering skills ([Author A, 2018](#)). Most recruits experience Phase 1 training as challenging, as they try to keep up with the physical and mental demands of the training. During a 14-week programme the recruits are expected to learn a large volume of information, and use it at any time. The recruits expected to retain this information while learning under challenging conditions, after rigorous physical activity or with reduced sleep ([Author A, 2018](#); [Curcio, Ferrara, & De Gennaro, 2006](#)).

This form of training was developed in an era where soldiers had to remember procedures and follow orders from senior officers. Now, however, soldiers have to be equipped to make their own decisions in ways that fit with the overall operation when working in the field ([Author A, 2018](#); [Conway, 2008](#)). Therefore, Phase 1 training has to be designed and delivered in ways that transform civilians into soldiers who can operate as Agile Warriors. Ideally this is achieved without overloading recruits with too much information ([van Merriënboer & Kirschner, 2007](#)), whilst maintaining a balance of tradition, changing training requirements, and demands from a modern soldier ([Author A, 2018](#)).

In a review of Phase 1 training [Author A \(2018\)](#) found that several recruits found the physical training and instructor-led approach, where instructors would sometimes “shout” commands, hard and at times stressful. Furthermore, Phase 1 training required recruits to learn a high volume of content, limiting opportunities to practice skills and reflect on lessons learned ([Author A, 2018](#)).

An alternative to Phase 1 training: The PAR Model

To become an Agile Warrior ([Liddy, 2004](#)) soldiers have to be motivated to develop physically and mentally through learning. Agile Warriors need to nurture a self-awareness that encourages them to become pro-active, self-regulated learners. They need to be able to plan their learning, have the skills and confidence to use different learning approaches and be able to reflect on what they have learned as they continuously and autonomously improve. The ability to be motivated ([Pintrich, 2003](#); [Pintrich & De Groot, 1990](#)), to self-regulate learning ([Panadero, 2017](#); [Pintrich & De Groot, 1990](#); [Zimmerman, 2000](#)), and to reflect ([Kember et al., 2000](#); [Lethbridge, Andrusyszyn, Iwasiw, Laschinger, & Fernando, 2013](#)) are therefore critical for Phase 1 training.

Therefore the British Army has to create a learning environment that supports recruits to become self-regulated learners, whom are aware of their strengths and weaknesses, have knowledge of different forms of learning strategies, know when and how to employ those strategies and reflect on their progress ([Panadero, 2017](#); [Pintrich & De Groot, 1990](#); [Zimmerman, 2000](#)). Self-regulated learning refers to the Self-generated thoughts, feelings and actions that are planned and cyclically adapted to the attainment of personal learning goals ([Zimmerman, 2000](#)).

Self-regulation enables recruits take an active role in managing their own learning, focussing on motivational, cognitive, affective and behavioural factors ([Orvis et al., 2009](#); [Pintrich, 2003](#)). Self-regulation also encourages reflection, which is critical for Phase 1 training and the development of troops who are able to make agile decisions ([Author A, 2018](#); [Kember et al., 2000](#); [Lethbridge et al., 2013](#)). According to [Kember et al. \(2000\)](#), [Dewey \(1933, p. 9\)](#) highlighted reflective thinking, which he defined as “active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that supports it and the further conclusion to which it tends”.

In order to transform Phase 1 training, we explored an instructional design approach called Present, Apply, Review ([PAR, Petty, 2009](#)). [Petty \(2009\)](#) encouraged instructors to adopt a constructivist approach to their teaching by developing activities that expand the existing knowledge of the recruits, while introducing new concepts and information. These activities should be set within the context of the learner, i.e., military training, and should not involve the types of rote learning the army has traditionally used, since this results in ‘surface’ learning ([Petty, 2009](#)).

The PAR model comprises three stages: 1) Present new material; 2) Apply this new learning; 3) Review the skills learned during this lesson. In the first stage, the

recruit is presented with new knowledge, concepts, skills, theories, and explanations by the instructor. Explanations are given by the instructor, or better, constructed by the recruit, to link new course material to their prior learning and experience. Teaching approaches include ‘instructor talk’, ‘Q&A’, and applying media, such as video demonstrations, visual aids, or written materials. Through these approaches recruits discover new concepts for themselves and explain these to their peers ([Author A, 2018](#)). In the second stage, Apply, recruits carry out an activity that requires them to use new concepts introduced by the instructor. Learning may be through approaches such as Q&A exercises and worked examples, or an evaluation of a case study. The recruits reflect on the gaps in their understanding, then take actions to improve their knowledge. This process is facilitated by self-assessment, peer explanation, acting on feedback from the instructor, and comparing their own work with others.

In the third stage, Review, the key learning points are highlighted and reviewed through dialogue that supports linking new concepts with existing knowledge. The model can be made more fluid by the instructor, for example having more than one ‘present’ and ‘apply’ phases in a lesson. While it is necessary to have the three phases included in the PAR process, the order is not vital.

The PAR model facilitates a constructivist approach to teaching, whilst keeping a structure to session planning. [Petty \(2009\)](#) identified that ‘optimal’ learning occurs when no more than 35% of instructional time is spent on the presentation of new material, at least 60% of instructional time allows students to actively apply concepts, and no less than 5% of instructional time is spent on reviewing learning or material.

There is evidence in the literature that the instructor is a critical factor in transforming civilians into agile warriors. A study of 2,293 New Zealand Defence Force trainees [Overdale and Gardner \(2012\)](#) found that instructors were the most important

source of social support, military belonging, and performance for recruits during initial training. In addition, a range of studies and meta-reviews of teachers' effectiveness ([Daly & Finnigan, 2010](#); [Ebert-May et al., 2011](#); [Hattie, 2009](#); [Marsh, 2007](#); [Stes et al., 2012](#); [Stes et al., 2010](#)) conclude that teachers have influence learners' motivation, self-regulation, and reflective thinking. For example, a large-scale PD programme in the Netherlands evidenced that providing teachers with space to work on their PD with peers from different units with weekly video conference catch-up sessions increased their intentions to deliver more student-centred teaching approaches ([Author B, 2013a](#)).

While PD of instructors has been found to have a positive impact on learners' attitudes, behaviour, and cognition, several authors ([Landsberg et al., 2012](#); [Stes et al., 2010](#)) indicated that few PD studies have tested the impact of PD in robust evidence-based settings with an appropriate "comparison" group. Furthermore, few studies have actually focussed on whether a new design approach to initial military training had a measurable impact on recruits' motivation, self-regulation, and reflective thinking in an (quasi-)experimental design.

Therefore, in this quasi-experimental study we explored the potential impact of PAR on recruits' motivation, self-regulation, and reflective thinking. Building on the work of [Pintrich \(2003\)](#); [\(1990\)](#), a wide body of work has found that motivation of learners and learning strategies have a substantial impact on learning processes and academic outcomes ([Artino, 2005](#)). Given the more student-centred approach of PAR, we expected that PAR participants would develop more intrinsic goal orientation (IGO) relative to extrinsic goal orientation (EGO) over time. Furthermore, we expected that PAR participants would develop more critical thinking (CT) and metacognitive self-regulation skills (MSR) in comparison to Non-PAR participants, who were taught more in a behaviourist manner. Given the concept of Agile Warriors, we also expected that

PAR participants would develop stronger reflective thinking ([Kember et al., 2000](#); [Lethbridge et al., 2013](#)) skills over time.

To the best of our knowledge, we are the first to conduct a (quasi-) experimental pre-post study of 212 participants over a period of 14 weeks to explore whether PAR instruction could be a potential student-centred instructional approach to develop agile warriors. Furthermore, in line with recent mixed method recommendations ([Author B, 2015a](#); [Lichtman, 2013](#)), we are keen to explore the lived experiences of PAR and Non-PAR recruits. Therefore, we aim to address the following two research questions:

1. To what extent does the introduction of PAR in initial recruit training in Phase 1 have a positive impact on PAR participants' motivation, self-regulation, and reflective thinking over time in comparison to Non-PAR participants
2. What are the lived experiences of PAR and Non-PAR participants in Phase 1?

METHOD

Setting and quasi-experimental design

In our quasi-experimental study, a British Army Training Centre (ATC) in the South of the UK was selected. Recruits in platoons were referred to as PAR if their respective instructor successfully completed the PAR instructor training course, which contains the teaching of the PAR methodology. If instructors had not attended the PAR course, then those recruits were categorised as Non-PAR. PAR-trained instructors taught 134 of the 311 recruits, leaving 177 Non-PAR recruits. The four PAR platoons constituted 104 male and 30 female recruits, while six Non-PAR platoons consisted of 177 male recruits.

In order to address this imbalance in gender, for Research Question 1 we opted to remove the female platoon in the PAR condition, and we removed 16 participants

who had missing pre- or post-data, leading to 97 participants in PAR and 115 participants in Non-PAR. The average age of PAR participants was 21.76 (SD = 3.39), and 21.53 (SD = 3.37) for Non-PAR participants. In terms of prior education, 41% of PAR participants had GSCE, 50% A-levels, and 8% above A-levels (e.g., Degree, Post-Graduate), while 33% of Non-PAR participants had GSCE, 56% A-levels, and 11% above A-level. 23% of PAR participants had prior experience with the army (e.g., Cadet training, preparation course), while 31% of Non-PAR participants had prior experience.

Instruments

Motivation and self-regulation

In the Motivated Strategies for Learning Questionnaire (MSLQ) instrument, [Pintrich \(2003\)](#) distinguished between motivation and learning strategies. In the original MSLQ six motivation subscales were developed, whereby we selected the four most relevant for Phase 1 training: intrinsic goal orientation (IGO, 3), extrinsic goal orientation (EGO, 3), control of learning beliefs (CLB, 3), and self-efficacy for learning & performance (SELP, 3). In terms of learning strategies, from the 9 subscales of [Pintrich \(2003\)](#) we selected the two most relevant for our study: critical thinking (CT, 2) and metacognitive self-regulation (MSR, 6). This means we included in total 20 items from the MSLQ, see Appendix Table 1 where the number of items per construct are illustrated in brackets, and the Likert response scale was from 1-7. The MSLQ has been previously used and tested in a wide range of studies ([e.g., Artino, 2005](#); [Author C, 2015a](#); [Panadero, 2017](#)).

Reflective thinking

In order to explore the impact of PAR on reflective thinking, we selected the Reflective thinking instrument by [Kember et al. \(2000\)](#), which comprised four constructs: habitual

action; understanding; reflection; and critical thinking. As Phase 1 focusses primarily on basic army training, we focussed only the first three constructs of habitual action (HA, 3), understanding (US, 3), and reflection (REF, 4). We added two additional items to measure instructional feedback (IF, 2) to explore the role of feedback provision by PAR and Non-PAR instructors. The 12 items used a Likert response scale of 1-5. The Reflective thinking instrument has been empirically tested and validated in a range of settings, and recently validated in a large scale study amongst 538 nurses ([Lethbridge et al., 2013](#)).

Data collection and analysis

Quantitative data analysis

The initial questionnaire was tested using think-aloud protocols during a pilot study, with both recruits from a different cohort and instructors from Phase 1. This process involved asking volunteer participants to verbally communicate their responses to each question, and to give critical feedback where they found any item to be confusing or not relevant ([Author A, 2018](#)). A follow-up group of two non-PAR platoons were used to test the updated instrument in the post-test stage, and responses from participants and respective Cronbach alphas indicated that the questionnaire made sense to participants.

Afterwards, the pre-post tests were distributed to 257 participants across eight platoons. Selected platoons were chosen at random during Week 2 for the Pre-questionnaire and Week 12 of Phase 1 for the Post-questionnaire completion. These weeks were chosen as access was limited during Week 1, but more importantly Week 12 comes before any of the final summative assessments. If recruits were to complete the questionnaire after either being successful or failing the course, this could affect their responses.

The combined response rate on the pre-post surveys was 93%. The Cronbach alphas indicated reasonable reliability for both the MSLQ and Reflective thinking instrument (see Appendix Table 1), with the notable exception of Habitual Action. While previous research in other contexts found good reliability of HA ([Kember et al., 2000](#); [Lethbridge et al., 2013](#)), the item “If I follow what the instructor says, I do not have to think too much on this course” did not load well on the other items. Therefore, we caution the reader in terms of this specific construct. Separate Factor Analyses of pre- and post-test data indicated similar factor structures as reported elsewhere (not illustrated). No significant differences were found between PAR and Non-PAR in terms of response rates on the pre-post test, neither were there differences in age, prior education, or prior military experience. In addition to our standard pre-post ANOVAs using SPSS 24, we also used machine learning approaches to explore the data using common data mining algorithms in WEKA ([Witten, Frank, Hall, & Pal, 2016](#)). Similar findings were obtained using WEKA, and therefore we report in this study more conventional ANOVA results.

Qualitative data analysis

In order to explore Research Question 2, eight interviews were conducted during week 13 of the training programme. Using the quantitative survey results, the research team selected 10 recruits based upon positive vs negative growth scores of the MSLQ and Reflective thinking surveys. Recruits with the greatest positive and negative differentials from respective platoons were chosen for follow-up interviews. Two participants could not be interviewed due to conflicting time schedules, therefore leading to 4 PAR and 4 Non-PAR interviewees.

Author 1, who was not affiliated with the respective ATC, conducted all interviews. A semi-structured format was used, which facilitated discussion of specific

topic areas whilst concurrently providing a platform for unforeseen themes to emerge from the interviews ([Lichtman, 2013](#)); Appendix Table 2 outlines the interview schedule. The confidentiality of all responses during the interviews were reiterated. In accordance with the protocols suggested by [Braun and Clarke \(2006\)](#), the qualitative data was analysed thematically.

Initially, the recorded interviews were transcribed digitally by Author 1 in order to provide a degree of acquaintance of the data, after which multiple readings of the interview transcript were conducted. A preliminary list of potential codes was produced during the second phase of analysis. Throughout this stage, extensive notes were created of themes or potential codes that could be used, with 10 draft codes being produced by the end of the stage. With the draft codes in mind, the interviews were re-read in order to critically review their application and relevance to the data, with the revised codes being increased to 14. Following this, the codes were arranged into three overarching themes: Learning, Motivational Climate, and Predispositions. In conjunction with the themes, the transcripts were re-read; however, this time critically reflecting on their validity.

After this was completed, each theme and code were provided with explicit definitions, serving as a template for the coding process. Concurrently, unmarked copies of the interview transcripts were coded independently by Author 2 and Author 3. The coding system was further revised following a comparison of notes between the authors, synthesising a robust coding system that established a final 13 codes, see Appendix Table 3. Ethics approval for this study was provided by the Open University Human Research Ethics Committee.

RESULTS

As indicated in Table 1, Non-PAR participants reported significantly higher MSLQ responses on extrinsic goal orientation (EGO), intrinsic goal orientation (IGO), self-efficacy for learning and performance (SELP), critical thinking (CT), and control of learning beliefs (CLB) at the pre-test in comparison to PAR participants, with a small to medium effect size. Furthermore, Non-PAR participants were significantly more positive in terms of understanding (US) in comparison to PAR participants after two weeks in Phase 1.

➔ Insert Table 1 about here

In terms of the post-test results, in contrast to our prior expectations PAR participants did not have higher (self-reported) motivation, self-regulation, or reflective thinking relative to Non-PAR participants after twelve weeks, as indicated in Table 1. While IGO significantly increased over time for PAR participants, Non-PAR participants had significantly higher IGO. In addition, SELP at the post-test was still significantly smaller for PAR participants relative to Non-PAR participants. While metacognitive self-regulation of Non-PAR participants increased over time, this was not the case for PAR participants. Furthermore, no significant differences were found in terms of reflection between PAR and Non-PAR.

As illustrated by the change in pre vs. post- scores in Figure 1, both IGO, EGO, CLB and SELP increased for PAR participants, but the same happened for Non-PAR participants with the exception of EGO. In terms of the MSLQ learning strategies, with respect to CT both groups reported a lower score at the post-test, while PAR participants improved relative to Non-PAR participants at the end of Phase 1. In terms

of the Reflective thinking scales, small differences were present over time and between PAR and Non-PAR. Finally, no significant differences were found in instructor feedback between the two conditions. Follow-up correlation analyses indicated that recruits with higher prior education and previous army experience had significantly higher pre-test scores, but not higher post-test scores (not indicated).

→ Insert Figure 1 about here

In other words, while we expected that PAR participants would become more motivated, self-regulated, and reflective over time, our quantitative findings indicated no positive effect for PAR (Research Question 1). For several scales we found the opposite effect where PAR participants had significantly lower scores than Non-PAR participants, both at the beginning and at end of Phase 1. In order to better understand this surprising finding, we will now turn to the qualitative findings and lived experiences of four participants who were trained in PAR, and four participants who were trained in Non-PAR.

Qualitative results

In total, 150 unique “messages” were coded from the eight interviews and in total 6,883 words were expressed by participants. The learning theme was the most discussed by these participants, comprising 46% of the coded units ($n= 69$). Non-PAR recruits more frequently discussed the methodology aspects of Phase 1; whilst PAR recruits more frequently discussed areas related to motivation. The motivational climate theme was the second most discussed by recruits, comprising of 35% of the total number of coded units ($n=53$). Finally, the predispositions theme contributed 19% ($n=28$) of the total number of coded units. In order to unpack the different narratives between the two conditions and lived experiences, we split the reporting into four groups: 1) positive

growth in PAR; 2) negative growth in PAR; 3) positive growth in Non-PAR; 4) negative growth in Non-PAR.

Group 1 Positive Growth under PAR instructor

One of the factors that most recruits had improved was their motivation, both in general and in relation to their learning. However, the data highlighted that increased motivation might be extrinsic, triggered by external sources, e.g., instructors, climate, rather than through intrinsic motivation, i.e., more internal drive mediated via PAR instruction.

‘It’s changed a lot since school, just being here, I’ve just sort of got my head down and got on with it. At school I didn’t really pay attention, stuff like that. Obviously now this could be my career so trying to do what I can.’ (Luke, male, PAR+)

Group 1 recruits found that their motivation and sense of urgency had increased in Phase 1. This self-perceived higher level of motivation could be due to other factors, which relate as the characteristics of recruits that came across as ‘stronger’ to the other recruits, and had a more positive experience of Phase 1.

‘If you come in strong you tend to stay one of the stronger ones, so you tend to want to be one of the better ones. Some of the people that came in and you thought were one of the better ones are still the ones who are going for best recruit.’ (Wanda, female, PAR+)

Similarly, Luke suggested that his background as a sports coach provided a solid foundation for the physical training aspects of Phase 1. Fitness is a key aspect of Phase 1, which was reflected in the physical code occurring six times during the interviews,

contributing 21% of the total occurrences, with recruits having to complete various fitness tests in order to successfully pass Phase 1.

'I think with basic training it's more of a confidence thing...PT [physical training] I'm comfortable with; outside of here I started as a sports coach.'

(Luke)

Wanda suggested that having experienced the academic rigours of university helped her during Phase 1. She attributed this to the similar discipline and structure of the two learning environments. As part of Phase 1 training, recruits were given a diary in which they made weekly entries describing how they were feeling. These diaries were read by their respective instructors to gain insights into any issues the recruits might be having. Recruits in Group 1 suggested that these diaries could be a useful tool when looking back over those entries to remind them of what they had covered up to that point.

'The diaries are quite useful for making you think about what you've done in the day. Sometimes people forget what they've done so the diaries are useful for that.' (Wanda)

However, there were conflicting comments as to how much time recruits had available to reflect on Phase 1. When asked about what Luke would change in Phase 1, he stated that he would allocate more 'you time', which would facilitate the conditions necessary to reflect effectively. Wanda confirmed the lack of time, but also suggested that it was very much dependent on what they have done that day will denote how much time there was for reflection.

'I think more 'you time', obviously some days have been horrible and some days have been good and that, but then you do your ironing you do your admin. So having 'you time' to chill out after that would be great.' (Luke)

Group 2 Negative Growth under PAR instructor

Group 2 recruits generally had a more negative narrative in terms of how their motivation had decreased during Phase 1. Lawrence and Wendy described the negative reactions they had to some of the instructor approaches, specifically in regard to shouting and being shouted at.

'Speak to me like a human being. That will at least give someone a positive so they can think "I'll try my best next time" instead of being shouted at, because it goes down and down.' (Lawrence, male, PAR-)

'Most of them are OK but you get these ones that, obviously I know that they try and shout at you to motivate you but it can have the opposite effect on somebody else. When someone's shouting at me I get really offended. It lowers my confidence completely. I had this a few days ago when they were saying "you might as well hand in your DOR [Drop out On Request] because you're not going to pass your TAB". I just have that stuck in my mind and I feel that has contributed to me failing today.' (Wendy, female, PAR-)

The traditional stereotype of an army instructor is one of a loud, brash manner that cares little about what you think, as long as you do as you are told. Whilst this might still exist to an extent in Phase 1, the British Army has been moving away from this stereotype by investing in coaching culture; one of the reasons for investigating the PAR methodology. Clearly the role of the instructor on recruits motivation, self-

regulation, and reflection could be seen in both Group 1 and 2, although with different impacts.

When discussing motivation, recruits in Group 2 tended to attribute their individual levels to instructor impact, as opposed to their own internal gauge. Notably, Lawrence was in the same platoon as Luke from Group 1, who had a very positive narrative in comparison. Lawrence described his experiences of some of his instructors as shouting at him, and in turn perceived it in a negative way. This was further complicated as Wendy, who previously mentioned how instructors could have a negative effect on her motivation levels, while also describing another instructor who provided essentially the opposite effect. She described the characteristics of the 'positive' instructor as attentive, praising, and willing to listen. This highlighted the importance not simply of the instructional methodology used, but the characteristics of instructors themselves, as previously highlighted by [Overdale and Gardner \(2012\)](#).

'Really encouraging yea. My section commander's the best, I wouldn't want to change her. She's really attentive and she's always praising us for things; she'll give us the disappointed mum speech if we do something wrong but she's always really nice and if you have any questions she'll always make time for you, whether she's busy or not, she'll talk on the move. She'll still listen to you.'

(Wendy)

Recruits in Group 2 provided limited evidence regarding self-regulated learning in their narratives. Lawrence stated that the way he experienced learning during Phase 1 was exclusively instructor-led, with information being communicated from instructor to recruit with limited dialogue. He noted that recruits needed different amounts of time to learn the information presented, suggesting that some recruits learned the

information and could then reflect, whereas others took so long to learn they had no time to reflect.

'All I can say is I've learnt a few things but the way the Army does learning is, let's say, the information is thrown at you. I feel that for some people it takes some time to sink in and to get the information.' (Lawrence)

However, although Lawrence agreed with some of the time-related comments from Group 1, he strongly suggested that there was no time at any stage during Phase 1 to learn the information. Tasks such as ironing and checking kit were prioritised as they had to be completed by recruits so they were ready for the following day, as they would receive “corrective punishments” if they did not.

'There's not enough time to learn anything in the evenings, there's no time to learn at all. And that's another thing that happened when we went to a lesson we were told we had time the previous night to do this, but you don't have enough time at all to be honest. Then in the evening they say it's your own time but then you have to do laundry, you have to iron, you need to do your kit, wash all your webbing, all that stuff.' (Lawrence)

Group 3 Positive growth under Non-PAR instructor

Similarly, Dan compared his time on the programme to his previous life before joining the army. This supported the previous comments from other interviewees that the environment of Phase 1 training could facilitate an increased level of motivation in a person, and not necessarily due to a method of instruction.

'It means I always want to excel at everything and do the best I can so I'm always putting in 100% effort, whilst I was in civvie street [a civilian] I always

thought “I can’t be arsed” or something like that. Now I’m always thinking to get things done.’ (Dan, male, Non-PAR+,)

When asked whether he had enough time to reflect during Phase 1, Warren suggested that sleep was another factor that took priority when all of the necessary tasks were completed. During Phase 1 and other military training, sleep deprivation could be a common occurrence. This sleep deprivation was used to teach recruits to get used to the feeling, and to be able to still carry out tasks when extremely tired. However, sufficient sleep is regarded as “essential” for learning ([Curcio et al., 2006](#)), creating a potential conflict between effective learning and military training. Recruits would also be less accustomed to the lack of sleep they would perhaps have normally received prior to joining the army. Warren went on to mention that, whilst he was aware of the workbooks, they were a lower priority than completing the other tasks, such as rifle cleaning, and therefore did not place a great deal of importance on them.

‘Not particularly no because as soon as you get back to the block [accommodation] you’re straight into doing admin and after that it’s almost straight to bed. You’ve got to keep on top of your sleep. You do have workbooks, they’re everything we learn. When you’re not cleaning your rifle or doing admin you can use that and fill in the missing word or something.’ (Warren, Non-PAR+, A-Levels, Cadets)

Group 4 Negative growth under Non-PAR instructor

When seeing Phase 1 through the eyes of a recruit, the thought of obtaining some breathing space through being organised so as not to draw the attention of the instructors, or to be able to reflect and not rushing to iron your clothes, would be a very

motivating factor. Being physically fit was again seen as a beneficial factor in regard to being successful.

'It comes down to how people cope with time management. If people can crack on and get their admin down and get what they need squared away then I think they've got a bit more time to relax and they find things easier...Same if you have a good level of fitness it just makes life easier for yourself.' (Dylan, male, Non-PAR-)

In contrast to Wanda, Dylan indicated that his experience at university did not prepare him to be self-regulated.

'I think the learning here is much better because university is a bit more off your own back, I think I work better under pressure and under that slight element of fear. Whereas university there's none of that, so for me personally it makes me learn better.' (Dylan)

Dan agreed that Phase 1 could be arduous and physically and mentally draining. He suggested that, not only did he find time on Phase 1 to be able to reflect; he emphasised the importance of this time to have the chance to process not only the learning but his own thoughts.

'Yeah I believe so, sometimes people in the troop might mess up and we lose time that way but we get enough time generally in the evenings after scoff [dinner] to do ironing or diaries or prep for the next day there's usually enough time... A lot of the days are quite long and physically exhausting so it's good to just be able to sit down, reflect, and think about what you've done. So it's been quite a good way to reflect.' (Dan, male, Non-PAR-)

DISCUSSION

Within the midst a rapidly changing global landscape, like many armies the British Army has had to adapt to its surroundings accordingly. This has included a decrease in serving personnel ([Brooke-Holland & Thurley, 2014](#); [HM Government, 2010](#); [House of Commons, 2014](#)). In order to mitigate the reduced numbers of staff, the British Army has started to redevelop and redesign their training programmes in order to produce more flexible and Agile Warriors ([Author A, 2018](#); [Liddy, 2004](#)). In this study we explored the impact of a new form of Phase 1 training to assess the effectiveness of a more constructivist-based methodology, namely as Present, Apply, Review ([PAR, Petty, 2009](#)). This is a fundamental change to training delivery, as previous instructional techniques have been based on behaviourist theories.

In terms of Research Question 1, our initial expectations were that with the more student-centred PAR approach recruits would become more motivated, self-regulated, and reflective thinkers over time. However, both our quantitative and qualitative findings displayed rather mixed results. On nearly all quantitative scales Non-PAR respondents reported higher motivation, self-regulation, and reflective thinking relative to PAR respondents over time. In addition, although some PAR participants did develop stronger motivation and self-regulation over time, the qualitative interviews indicated that PAR and Non-PAR instructors seemed to teach in similar manners.

One potential reason why we did not find significant positive effects for the PAR instruction method could be related to how PAR was implemented in practice. Perhaps PAR instructors were not always teaching in a 'PAR-like' manner, reverting to teaching approaches they were familiar with. This tendency to adhere to existing teaching practice was also observed in a large scale longitudinal study by [Ebert-May et al. \(2011\)](#) who observed 77 teachers engage within a PD programme for a year,

observing their classroom teaching in practice at various points in time. This research evidenced that although the teachers reported that PD supported them in understanding the benefits of constructivist and student-centred forms of teaching, their teaching practice remained the same. Similar findings were reported by [Stes et al. \(2012\)](#) in a quasi-experimental study with 1000 higher education students, indicating that even though instructors are trained to adopt student-centred teaching practice, their inherent beliefs, culture, and daily practice might not change accordingly. Changing teaching approaches of instructors is inherently difficult ([Ebert-May et al., 2011](#); [Marsh, 2007](#)), and may need substantial incubation time as well as senior management support ([Author B, 2015a](#)).

Another potential reason why PAR instructors might not have fully internalised the PAR methodology might be related due to the lack of time to implement changing the lessons sufficiently. An instructor usually works in a respective ATC for two years and may only have two or three platoons, therefore teaching a specific lesson two or three times at the most. It is possible that the PAR instructor may not have the time, or motivation, to fundamentally alter a lesson that they may only teach one more time. There is no evidence that the instructors actively resisted the PAR approach, but [Piderit \(2000\)](#) argued that beyond cognitive intentions to change there might be emotional intentions and adherence to familiar forms of cultural practices that might have prevented instructors to change their teaching practice.

A range of studies the organisation culture and disciplinary context of organisations illustrates the influence of systemic forms of culture on the ways instructors design and teach in practice ([Author B, 2013a, 2015a](#); [Daly & Finnigan, 2010](#); [Ebert-May et al., 2011](#); [Petrovic et al., 2018](#)). If the prevailing culture at the respective ATC was to primarily teach using a instructivist way, even if the intentions

of the PAR instructors might be to adopt a student-centred approach to their teaching, it might be difficult to change practice in the short-term.

In the follow-up interviews there was emerging evidence that PAR and Non-PAR instructors were not always teaching in a constructivist manner (Research Question 2). Under both conditions PAR instructors were occasionally shouting at recruits, which might negatively impact motivation and affect self-regulation for some recruits. At the same time, the recruits mentioned more often the environment in which they were learning, rather than the instructional approaches to training they had experienced. Most recruits stated that there was limited time to reflect on what they had done during the day or that. If time became available, other tasks - such as cleaning, ironing, and preparing kit ready for the next day – were prioritised. This would suggest that Phase 1, and more specifically the environment during the initial training, may have impeded the recruits' abilities to develop as reflective practitioners, specifically citing the limited effectiveness of the reflective resources such as the diaries.

At the same time, as highlighted in earlier studies ([Hattie, 2009](#); [Orvis et al., 2009](#); [Overdale & Gardner, 2012](#); [Petrovic et al., 2018](#); [van Merriënboer & Kirschner, 2007](#)) individual differences in terms of pre-dispositions (e.g., physical ability), motivational climate (e.g., instructor) and learning factors (e.g., self-regulation) played a strong role in terms of whether recruits reacted positively or negatively to the instructional method, irrespective whether it was delivered in a PAR or Non-PAR manner. Interviewed recruits who had negative responses generally suggested that there was no time in Phase 1 at all to reflect, whilst those who responded positively suggested there was time, but that it was inconsistent and required recruits to be organised to free up that time – placing blame on external factors (i.e., Phase 1 itself) instead of taking

responsibility and ownership of their time, which is one of the main intangible purposes of Phase 1 training.

Overall, the majority of respondents were in favour of the practical, hands-on lessons. However, these lessons, such as rifle drill, are predominantly set in how they are delivered; there is only a certain way to accomplish the required learning outcome for the instructors and there is little room for innovation and student-centred learning that PAR should help to facilitate.

Research Limitations

This study used a robust mixed methods quasi-experimental pre-post approach in order to unpack recruit experiences during Phase 1 training, where we used well-defined and validated instruments to measure (self-reported) changes in motivation, self-regulation, and reflective thinking over time. One obvious limitation is the use of self-reported instruments, which of course can suffer from a range of biases. At the same time, with the notable exception of habitual action all scales seemed reliable, and Non-PAR participants were consistently more positive about their motivation and self-regulation than PAR-participants.

Another obvious limitation was that we selected a range of platoon instructors based upon their PAR training, but whether these instructors actually taught in line with the PAR recommendations could not be verified. Follow-up research and fine-grained class observations like those done by [Ebert-May et al. \(2011\)](#) would be needed to better understand which instruction methods were used, and which of these methods are more useful for some recruits, while others might benefit from different methods and pedagogical approaches.

Practical Implications

Our research highlights overall that most participants would enjoy and prefer a more constructivist, student-centred approach. Whilst the majority of recruits agreed that the reflective diaries and workbooks were useful for reflection, this was restricted by the time available to use them. One recommendation would be to ensure that there is allotted time during Phase 1 for reflective practice. As indicated by a range of recruits, this time needs to be ring-fenced, as there is a natural tendency to catch up on the aforementioned administrative tasks, such as cleaning, or indeed sleep, rather than reflect.

Whilst the benefits of constructivism are known, the restrictive nature of Phase 1 essentially may have strangled the proper implementation of PAR to its detriment. As a result, PAR was in danger of being stopped from being deployed into the wider army, where it would be able to be used as it is intended due to the flexibility and time available for continuous professional training compared to the tight restrictions of Phase 1. Phase 1 is more about learning physical, motor skills and training muscle memory, rather than developing conceptual ability, i.e., developing the “thinking soldier”. Therefore, our second recommendation would be to implement PAR in Phase 2 or Phase 3, where there is more time to reflect, while at the same time more complex cognitive skills are needed to solve complex problems in comparison to the more physical Phase 1.

Finally, effective transition management is at the heart of successful organisational change ([Daly & Finnigan, 2010](#); [Piderit, 2000](#)). It involves helping people to understand and manage the process that they go through when they experience change. Leaders can increase their capability in this area by developing greater awareness of the emotional, psychological, and physical impact of the process,

understanding how people are responding to change and intervening appropriately. Recognising that the impact of PD takes time, and is social in nature, we hope that when more British Army instructors start to engage with PAR an actual cultural shift will impact new recruits to become the Agile Warriors of the future.

6. REFERENCES

Artino, A. R. (2005). Review of the Motivated Strategies for Learning Questionnaire.

Online Submission.

Author A. (2018). Details removed for peer review.

Author B. (2013a). [details removed for peer review].

Author B. (2015a). [details removed for peer review].

Author C. (2015a). [details removed for peer review].

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. doi: 10.1191/1478088706qp063oa

Brooke-Holland, L., & Thurley, D. (2014). Armed Forces Redundancies. London: International Affairs and Defence; Business and Transport. House of Commons Library

Conway, J. T. (2008). *A concept for enhanced company operations*. Washington: Department of the Navy, Headquarters, US Marine Corps.

Curcio, G., Ferrara, M., & De Gennaro, L. (2006). Sleep loss, learning capacity and academic performance. *Sleep Medicine Reviews*, 10(5), 323-337. doi: 10.1016/j.smrv.2005.11.001

Daly, A. J., & Finnigan, K. S. (2010). A bridge between worlds: understanding network structure to understand change strategy. *Journal of Educational Change*, 11(2), 111-138. doi: 10.1007/s10833-009-9102-5

- Dewey, J. (1933). *How we think: a restatement of the relation of reflective thinking to the educative process*. Boston: D.C. Heath.
- Ebert-May, D., Derting, T. L., Hodder, J., Momsen, J. L., Long, T. M., & Jardeleza, S. E. (2011). What We Say is Not What We Do: Effective Evaluation of Faculty Professional Development Programs. *BioScience*, *61*(7), 550-558. doi: 10.1525/bio.2011.61.7.9
- Hattie, J. (2009). *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement*. New York: Routledge.
- HM Government. (2010). *Securing Britain in an age of uncertainty: the strategic defence and security review* (Vol. 7948). London: The Stationery Office.
- House of Commons. (2014). *Future Army 2020*. London: House of Commons Defence Committee.
- Kember, D., Leung, D. Y. P., Jones, A., Loke, A. Y., McKay, J., Sinclair, K., . . . Yeung, E. (2000). Development of a Questionnaire to Measure the Level of Reflective Thinking. *Assessment & Evaluation in Higher Education*, *25*(4), 381-395. doi: 10.1080/713611442
- Landsberg, C. R., Astwood, R. S., Van Buskirk, W. L., Townsend, L. N., Steinhauser, N. B., & Mercado, A. D. (2012). Review of Adaptive Training System Techniques. *Military Psychology*, *24*(2), 96-113. doi: 10.1080/08995605.2012.672903
- Lethbridge, K., Andrusyszyn, M.-A., Iwasiw, C., Laschinger, H. K. S., & Fernando, R. (2013). Assessing the psychometric properties of Kember and Leung's Reflection Questionnaire. *Assessment & Evaluation in Higher Education*, *38*(3), 303-325. doi: 10.1080/02602938.2011.630977

- Lichtman, M. (2013). *Qualitative research in education: a user's guide* (3 ed.). Thousand Oaks, CA: Sage.
- Liddy, L. (2004). The strategic corporal: some requirements in training and education. Education, training and doctrine. *Australian Army Journal*, 2(2), 139-148.
- Marsh, H. W. (2007). Do university teachers become more effective with experience? A multilevel growth model of students' evaluations of teaching over 13 years. *Journal of Educational Psychology*, 99(4), 775-790. doi: 10.1037/0022-0663.99.4.775
- Muth, J. (2011). An elusive command philosophy and a different command culture. *Foreign Policy*, 9.
- Orvis, K. A., Horn, D. B., & Belanich, J. (2009). An Examination of the Role Individual Differences Play in Videogame-Based Training. *Military Psychology*, 21(4), 461-481. doi: 10.1080/08995600903206412
- Overdale, S., & Gardner, D. (2012). Social Support and Coping Adaptability in Initial Military Training. *Military Psychology*, 24(3), 312-330. doi: 10.1080/08995605.2012.678243
- Panadero, E. (2017). A Review of Self-regulated Learning: Six Models and Four Directions for Research. *Frontiers in Psychology*, 8(422). doi: 10.3389/fpsyg.2017.00422
- Petrovic, I., van Stekelenburg, J., & Klandermans, B. (2018). Dealing with austerity measures within armed forces: The Dutch case. *Military Psychology*, 30(4), 321-334. doi: 10.1080/08995605.2018.1478536
- Petty, G. (2009). *Evidence-based teaching: A practical approach*. Oxford: Nelson Thornes.

- Piderit, S. K. (2000). Rethinking Resistance and Recognizing Ambivalence: A Multidimensional View of Attitudes toward an Organizational Change. *The Academy of Management Review*, 25(4), 783-794. doi: 10.2307/259206
- Pintrich, P. R. (2003). A Motivational Science Perspective on the Role of Student Motivation in Learning and Teaching Contexts. *Journal of Educational Psychology*, 95(4), 667-686. doi: 10.1037/0022-0663.95.4.667
- Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82(1), 33-40.
- Spain, R. D., Priest, H. A., & Murphy, J. S. (2012). Current Trends in Adaptive Training With Military Applications: An Introduction. *Military Psychology*, 24(2), 87-95. doi: 10.1080/08995605.2012.676984
- Stes, A., De Maeyer, S., Gijbels, D., & Van Petegem, P. (2012). Instructional development for teachers in higher education: effects on students' learning outcomes. *Teaching in Higher Education*, 17(3), 295-308. doi: 10.1080/13562517.2011.611872
- Stes, A., Min-Leliveld, M., Gijbels, D., & Van Petegem, P. (2010). The impact of instructional development in higher education: The state-of-the-art of the research. *Educational Research Review*, 5(1), 25-49. doi: 10.1016/j.edurev.2009.07.001
- van Merriënboer, J., & Kirschner, P. (2007). *Ten Steps to Complex Learning*. New York: Routledge.
- Witten, I. H., Frank, E., Hall, M. A., & Pal, C. J. (2016). *Data Mining: Practical machine learning tools and techniques* (4 ed.). Amsterdam: Morgan Kaufmann.

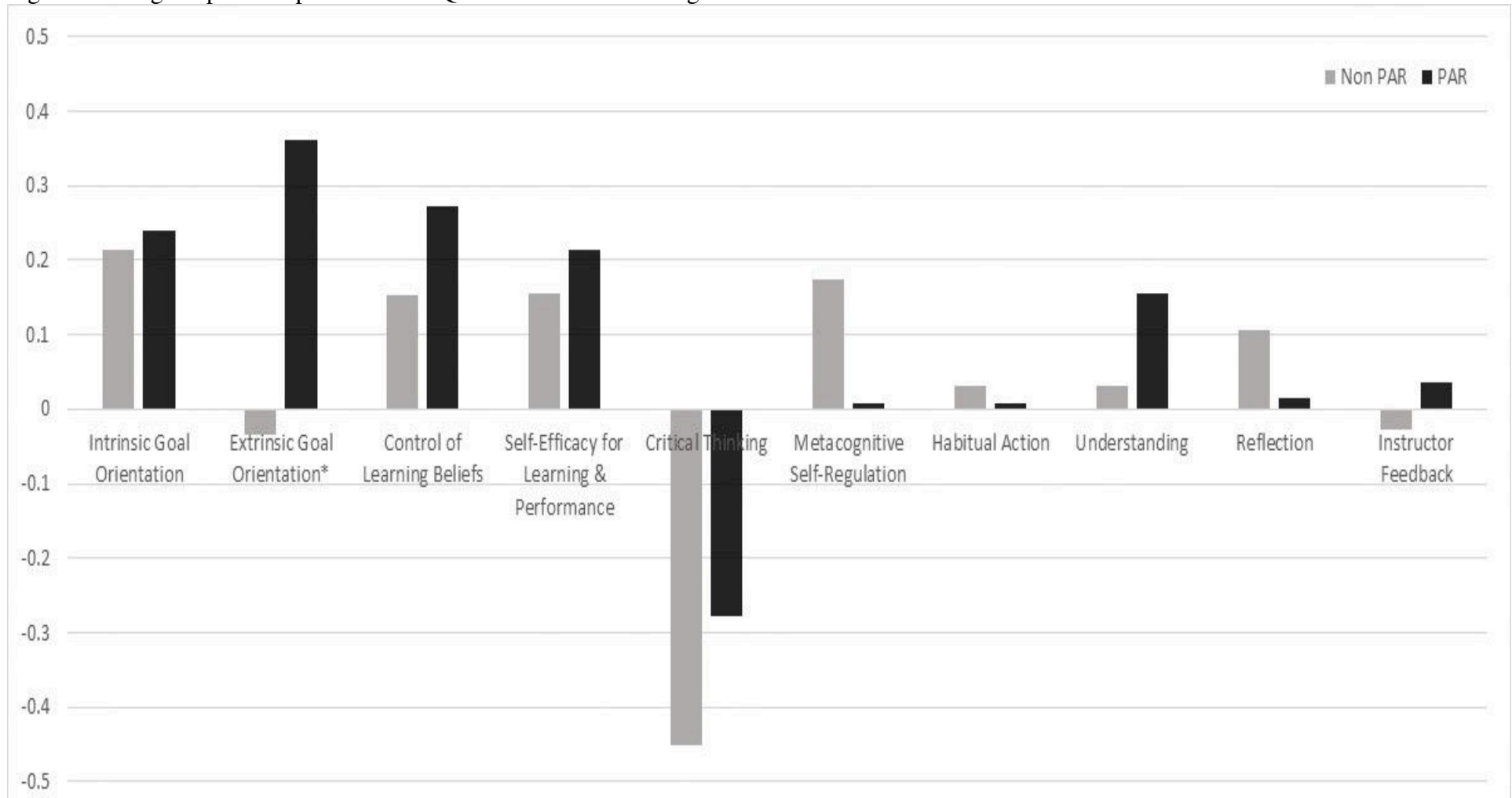
Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13-39): Elsevier.

Table 1 Pre- and post- MSLQ and Reflective Thinking scores of PAR vs. Non-PAR

	Pre-test		PAR		Post-test		PAR		F-value pre-test	F-value post-test	n pre-test	n post test
	Non-PAR		Non-Par		Non-Par		Non-Par					
	M	SD	M	SD	M	SD	M	SD				
Intrinsic Goal Orientation (IGO)	5.72	0.77	5.32	1.04	5.94	0.67	5.56	0.97	10.208***	10.819***	.046	.049
Extrinsic Goal Orientation (EGO)	6.24	0.73	5.61	1.19	6.21	0.71	5.97	1.04	22.889***	4.021*	.098	.019
Control of Learning Beliefs (CLB)	5.04	1.11	4.71	1.16	5.19	1.14	4.98	1.11	4.497*	1.820	.021	.009
Self-Efficacy for Learning & Performance (SELP)	5.76	0.83	5.32	1.23	5.92	0.89	5.53	1.03	9.529***	8.402***	.043	.038
Critical Thinking (CT)	5.27	0.95	4.88	1.10	4.82	0.75	4.60	0.93	7.754***	3.584	.036	.017
Metacognitive Self-Regulation (MSR)	4.91	0.70	4.71	0.90	5.08	0.70	4.72	0.77	3.097	12.62***	.015	.057
Habitual Action (HA)	3.59	0.65	3.59	0.62	3.63	0.65	3.60	0.69	.000	.073	.000	.000
Understanding (US)	4.54	0.56	4.33	0.63	4.57	0.49	4.49	0.57	6.444*	1.347	.030	.006
Reflection (REF)	3.84	0.65	3.82	0.56	3.95	0.62	3.84	0.59	.050	1.745	.000	.008
Instructor Feedback (IF)	3.95	0.85	3.79	0.81	3.92	0.83	3.82	0.90	1.921	.659	.009	.003

N = 212 * p < .05, *** p < .001

Figure 1 Change in pre- and post-test MSLQ and Reflective thinking scores of PAR vs Non PAR



Appendix Table 1 MSLQ and Reflective Thinking items and Cronbach Alphas

	Items	Exemplar item	Cronbach alpha Pre-test	Cronbach alpha Post-test
MSLQ		(Pintrich & De Groot, 1990)		
Intrinsic Goal Orientation (IGO)	3	The most satisfying thing for me on this course is trying to understand the content as thoroughly as possible	.670	.634
Extrinsic Goal Orientation (EGO)	3	Getting a good report on this course is the most satisfying thing for me right now	.764	.672
Control of Learning Beliefs (CLB)	3	If I try hard enough, then I will understand the course material.	.638	.653
Self-Efficacy for Learning & Performance (SELP)	3	I believe I will receive an excellent report on this course	.868	.845
Critical Thinking (CT)	2	Whenever I read or hear a conclusion or idea, I think about possible alternatives	.679	.666
Metacognitive Self-Regulation (MSR)	5	If I find something difficult to understand, I change the style I try to learn it	.684	.647
Reflective thinking		(Kember et al., 2000)		
Habitual Action (HA)	3	When I am working on some activities, I can do them without thinking about what I am doing	.329 [†]	.423 [†]
Understanding (US)	4	This course requires me to understand concepts taught by the instructor	.783	.717
Reflection (REF)	4	I often reflect on my actions to see whether I could have improved on what I did	.678	.642
Instructor Feedback (IF)	2	The feedback that I receive helps me develop my learning	.678	.705

n = 212, [†] We caution the readers for this scale

Appendix Table 2 Semi-structured interview questions

1	How's the course been so far?
2	Any particular best or worst moment that you've had so far?
3	Some recruits might be like you in that they've enjoyed some parts but struggled with other parts. Do you have any thoughts or ideas as to why that might be the case?
4	In regard to the instructors, how was their style of lesson delivery?
5	Did you find that it was information from the instructors or did they get you to find out information yourself?
6	Have you been able to reflect on the learning you've had throughout the course?
7	Have the instructors done anything in particular that has helped you in your learning?
8	If you had to describe the way they teach, how would you describe what they do?
9	What lessons do you think you've learnt the most in?
10	Do you think your motivation for learning has changed?
11	Was the onus on you to learn rather than just receive the information?
12	Do you think that your motivation has changed at all whilst being here?
13	How have you found the way that they've taught lessons?
14	Have you been able to reflect on the lessons you have during the day?
15	Do you feel that your motivation has changed at all?
16	Do you think that in this environment you are trying to be the best of yourself, the best you can be, or is it just more about survival and making sure you are better than a couple of other people?
17	If you could change anything on the course to help improve learning what would that be?

Appendix Table 3 Summary and definition of interview codes

Code	Definition
<i>Learning Elements</i>	Codes related to forms of learning that took place or aspects that facilitated a learning environment during the recruits' course
-Reflection	Statements related to the recruits' ability to reflect and their own reflective comments made during the interview
-Motivation to learn	Statements related to the perceived change in recruits' motivation levels, such as "if someone asked me to do something I'd do it straight away"
-Self-Regulated Learning	Statements about recruits' approach to learning
-Kinaesthetic Learning	Statements referencing the hands-on nature of some of the lessons e.g. rifle drill
-Repetition	Statements related to a specific teaching technique
-Methodology	Statements about different types of teaching techniques recruits receive during the course
<i>Motivational Climate</i> (external factors)	Codes related to external aspects of the course beyond the control of the recruits' that affect their intrinsic tendencies
-Instructor Impact	Statements that reflect the influence of the instructors on the recruits
-Volume of Training	Statements referencing the perceived amount of lessons and evening work entailed within the course
-Social Factors	Statements about the impact of social relationships between recruits and how a recruit feels regarding his/her own standing and of others
-Time Factor	Statements relating to the amount of time recruits feel they have during the course or for specific tasks
<i>Predispositions</i>	Codes related to personal aspects separate from the programme that could facilitate success on the course
-Physical Ability	Statements related to physical attributes such as fitness levels and injuries
-Character Traits	Statements related to recruits' intangible characteristics, such as "was more relaxed, I was getting by, I wasn't tense or upset with anything"
-Prior Life Experience	Statements about how prior life experience, e.g. school, work etc., influence success on the course