Effective Blended Learning for First Aid Training

A Guide for Red Cross and Red Crescent National Societies

Dr Alison Mead Richardson

Acknowledgements

Acronyms & Abbreviations

AmRC	American Red Cross
AFAM	African First Aid Materials
BL	Blended learning
BRC	British Red Cross
BRCF	Belgian Red Cross Flanders
CRC	Canadian Red Cross
F-F	Face to face (learning)
GDPC	Global Disaster Preparedness Center
ICT	Information and Communication Technology
NLRC	Netherlands Red Cross
NS	National Society
NZRC	New Zealand Red Cross
OER	Open Education Resources
RC/RC	Red Cross/Red Crescent
ROI	Return on Investment

Table of Contents

1. Introduction

In 2012, the British Red Cross Society introduced a First Aid App as part of their strategy to make first aid training more easily accessible to a broader range of people. They licenced the app to the Global Disaster Preparedness Center (GDPC) who then launched the Universal App Program (UAP). This included a toolkit to facilitate the adaptation and localization of the first aid and hazard apps to be used in countries across the globe, putting preparedness information directly into people's hands.

Through the Universal App Program, the GDPC has created a platform to facilitate the adaptation and localization of mobile applications (apps) with first aid and hazard information for use in countries across the globe. The First Aid app includes guidance on everyday first aid scenarios that allows the app users to find easy instructions and learning opportunities on actions to take in emergency situations. The Hazard app provides general preparedness guidance and rapid notification of critical early warning alerts to end users for country specific hazards.

This **Guide to Effective Blended Learning for First Aid Training** is designed to help National Societies to consider if a blended learning approach, using the First Aid App, will help them to meet their training needs. It draws on academic research literature particularly from higher education where blended approaches have been used for over a decade and there is evidence of effectiveness in blended approaches. The guide also refers to a number of online resources for blended learning in higher education as these have some applicability in the RC/RC network context.

The guide brings together insights from the National Societies who are already offering blended first aid training, discusses some of the main issues in implementing blended learning and proposes some strategies for going forward. With 100+ NS having contextualized the GDPC First Aid app, spread right across the RC/RC network, there is a wide disparity in the size, complexity and context of the National Societies. Strategies will be appropriate and relevant for individual NS at different times.

The literature review for this study identified a set of relevant research studies and useful resources that inform us about different aspects of blended and mobile learning. Throughout the guide, reference is made to these articles and other resources, many of which it has been noted, come from higher education where blended learning has been implemented and researched for over a decade. The full list of useful resources on blended learning is provided in Section 7.

How this guide is structured

There are 7 sections in this guide and each one presents and aims to answer key questions about blended learning for first aid training in RC/RC National Societies. The sections draw on learning from National Societies which are already using a blended approach in order to inform and guide those who are at the planning stage. The guide also presents results from the survey where these illustrate or inform the issues regarding the implementation of blended learning.

2. What do we mean by blended learning?

- *What are key concepts in blended learning?*
- *How is blended learning different from other forms of training?*
- *What are the models of blended learning?*

First we will look at an expanded description of blended learning.

A definition of blended learning

Blended Learning is an appropriate mix of face-to-face and technology-enabled learning activities, using traditional instruction, guided support and independent learning. It involves the use of digital technologies and is systematically designed using strong pedagogic and andragogic principles, to support learner engagement and success. It is characterised by reduced classroom time and more choice and flexibility for the learner and sometimes enables a reduction of cost of training and economies of scale.
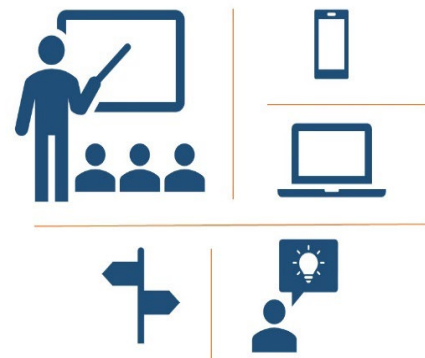
Key Concepts

The main concept in considering a blended approach is that it involves a re-thinking of how training is delivered. It is not just about adding some online or app-based elements or infusing some other technology like video. To quote Garrison and Kanuka[1] *blended learning is both simple and complex'*. This is helpful because educators can develop their own concept of blended learning and it can be as simple or as complex as it needs to be to suit their own training context.

There are myriad definitions for the key concepts in technology-enabled learning. Here, we have given descriptions of the concepts considered to be the most useful in the context of this study and how they relate to a blended approach.

eLearning

Electronic learning, or eLearning, is often used to refer to all forms of learning that are based on electronic devices, both online and offline. Elearning an be computer or mobile device-based andoes not necessarily involve the Internet. eLearning is often ombined with face-to-face learning in a blended approach.

---

[1] Garrison & Kanuka (2004)

Online learning

Similar to elearning but requires an internet connection and makes use of the communications functions of the Internet for interactive learning. Can be a stand-alone teaching and learning model or may be included with traditional instruction as part of a blended approach.

Mobile Learning

Mobile learning or mlearning involves the use of mobile devices such as mobile phones and tablets. Mobiles can be used for informal, self-directed learning as well as formal and non-formal education. Learning is designed in 'manageable chunks', often employing aspects of online games, and people study when and where they want. mLearning is often blended with traditional instruction for skills training.

Technology enabled learning (TEL)

TEL can be conceptualised as training and education which is primarily face-to-face being augmented or enhanced with educational technology which is used to provide content and further learning opportunities.

Resource-based learning

This term refers to any form of learning that is based on printed or electronic resources. It may be a complete course or part of blended learning.

> Effective blended learning is more than just tips and techniques; understanding the key concepts in blended learning and what makes it successful are important.
> Cleveland-Innes 2018

Terms used in our definition

Traditional instruction – describes classroom based, instructor-led training that is the predominant form of first aid training.

Independent learning – sometimes called self-directed learning but describes learning that happens when an individual decides for themselves to find out about something.

Flexibility – is a key concept in adult learning as it provides for learner choice about when, where and how to study. In some cases learners also have choices about what to study. Flexible learning is also about removing barriers to learning.

Guided support – even when studying independently, learners need guidance on the best resources to use and to some extent on what they need to learn. They also need to know where they can get help if they require it.

Sound pedagogic and andragogic principles – require educators to consider the characteristics and needs of their target audience and plan learning activities which are relevant and appropriate. Designing training activities for children and young people requires different teaching and learning strategies than designing training for adults.

Economies of scale – Technology-enabled learning can enable a training provider to achieve economies of scale if they have sufficient learners. What this means is that the unit costs of training (cost per learner) are reduced as more learners are enrolled.

How is a blended approach different?

A blended approach is different because rather than relying on one (traditional) training method, it takes the most appropriate technology and media for different aspects of course content and blends them together. There is always a face-to-face element in a blended course, but it is not the only element.

In the blended model, content and learning activities are divided between face-to-face instruction and independent study through technology. Blended learning is systematically designed to be learner-centered not instructor- or content-centered.

- Instructor-centered training starts from the point of what the instructor knows and is often delivered in a didactic approach.
- Content-led training starts from a position of, 'what is the content of this subject that the learner has to learn?'
- Blended learning starts from a consideration of 'what does the learner have to be able to do by the end of this course?' and 'what are the best teaching and learning strategies for enabling the learner to gain this knowledge and competence?'

The systematic design aspect is important because the learning activities are mapped out in advance of the training and a 'media mix map' developed. This enables the most appropriate instructional method to be applied to different types of content and learning activity.

Models of blended first aid training

There are two main forms of blended learning in use in RC/RC National Societies; blended online, and blended app-based. The model is essentially the same although the technology used is different.

In **blended online learning**, content is accessed via laptop or personal computer in advance of practical, face-to-face training. Knowledge tests are set and must be passed to a high standard before learners can register for skills training.

Blended app-based training follows a similar model although learning content is specially designed for study on a mobile device and learners access the content through an app or application. The use of an app gives greater possibility for using a gaming approach to learning which includes stories, challenges, points and awards.

Changing technical standards and an increase in interoperability means that increasingly, online learning is accessed through a mobile device. This makes the distinction between blended online and blended app-based learning more blurred.

3. Benefits and challenges of blended learning

- *How effective is blended learning in First Aid training?*
- *Does a blended model improve learning outcomes?*
- *What are the challenges of blended learning?*

The benefits of blended learning in higher education are well known and this is evidenced by the increasing worldwide take-up of this model for formal post-secondary education. But are these benefits translated into a non-formal training context such as first aid? One of the first things managers of National Societies are likely to ask, is '*what are the benefits of blended learning – why should we do this*?'

Evidence from research indicates that blended learning has grown rapidly and is now widely used in formal and non-formal education and training. A meta study carried out by the US Department of Education found that '...*in studies contrasting blends of online and face-to-face instruction with conventional face-to-face classes, blended instruction has been more effective*'[2]. Blended learning in health knowledge acquisition has been shown be as effective as in-person instruction in health professions [3,4].

Another study identifies key benefits of blended learning as including increased flexibility allowing students to learn without the barriers of time and location but having in-person support available; increased interaction – blended learning offers a platform to facilitate greater interactivity between students; and enhanced learning, additional types of learning activities improve engagement and help students achieve more meaningful levels of learning.[5]

Blended learning for first aid can enable organizations to deliver consistent quality through standard modules especially if training is required in multiple locations. Organizations can save costs by conducting shorter hands-on sessions to reinforce skills and knowledge. In addition, availing content online provides learners with the flexibility to access content at their own pace and

[2] Means, B. (2010)
[3] Kho M.T.H, et. al (2016)
[4] Liu Q et al (2016)
[5] Cleveland-Innes & Wilton (2018)

time therefore individualizing the learning. Learners can also engage in interactive exercises through video clips and computer generated animations to improve understanding and content retention[6].

Results of an evaluation study measuring the effectiveness of blended learning course for front line health care professionals in Ethiopia found blended learning to be an effective pedagogical approach enabling hands on training while keeping costs low and reaching a wider number of participants[7].

Results from in a study in Austria teaching first aid and CPR at a medical university indicated that majority of the learners regarded the blended learning approach as useful and would consider taking courses offered in the same manner in the future. These factors were considered, by the study, as proof of sustainability[8].

It is clear there is research evidence of benefits of blended learning which include learner acceptability, improved learner engagement, improvement learner motivation, consistent quality of learning content, lower training costs, and reaching more learners.

Learning from National Societies

In 2015, research by the **American Red Cross** identified four benefits of blended learning. These included:
1) a safe environment for learners to engage with the course material
2) an opportunity to explore realistic emergency scenarios therefore increasing learners' confidence when faced with a real life emergency scenario
3) increased knowledge retention due to interactive platforms that respond to a variety of learning styles
4) an opportunity for learners to practice through simulated learning [9].

In 2016, the **British Red Cross** carried out a comparative study of blended online and classroom only training and found that blended learning was more effective at increasing learner confidence and face-to-face learning was more effective at increasing knowledge. They recommend that future research should focus on analysing the best 'blend' of skills to be delivered through this approach in order to maximise knowledge acquisition as well as confidence building.

The BRC study indicates that blended learning is an effective pathway for learning first aid. Blended learners made improvements in all aspects of their first aid understanding; they were positive about the use of an online platform to deliver a learning experience about first aid; and they enjoyed learning first

---

[6] Rowe B. (2010)

[7] Manyazewal T. et al. (2017)

[8] Zajic P., et al (2016)

[9] Busick J. (2015)

aid in this novel way. The British Red Cross suggest that future improvements to their blended offering might include: allowing learners to download their learning session for offline access; including signposts or links to deeper first aid learning within the online learning; and allowing learners continued access to the learning environment after their course.[10]

Improved learning outcomes

One of the questions an NS must ask is '*will a blended learning approach help us to improve learning outcomes*?' but the evidence for this is currently sparse and the results are mixed. When we asked five NS currently offering blended first aid training to what extent the blended approach improved learning outcomes,

- 2 answered – not at all
- 2 answered noticeably
- 1 answered significantly

So like many questions, the answer is, 'it depends!' There are many variables in improving learning outcomes and each training context is different. Variables will include learner characteristics and motivation to learn, training methods chosen, instructor skills, knowledge and attitudes and of course the content itself and how it is presented or technology-mediated.

Improved cost-efficiency

Similarly, we do not yet have definitive answers about cost-efficiency. Cost analysis has been carried out by three of the five NS using a blended approach. Noticeably lower training costs are reported by 2 NS; slightly lower costs reported by 1 NS and 2 NS reported there has been no reduction in training costs. Blended learning is at least as cost-efficient as traditional training and has the potential to be more cost-effective especially when large numbers of people are being trained in one programme. This is an area for increased research focus.

Learning from National Societies
NZRC reports '*We have seen significant migration and new business to blended learning which has resulted in both efficiencies and overall business growth'*. This indicates it is possible for a blended learning approach to impact positively on efficiency and income growth. More research is needed into the conditions for this positive change.

---

[10] Oliver E., Coleburn D., Taylor H. (2016)

Table 1 shows the percentage of NS who are currently offering blended first aid training reporting the following benefits:

40%	More people are using it for training than used to come for in-person training	access
60%	The training is better quality because the information is consistent	quality
40%	Instructors are using the app to improve their own first aid knowledge	quality
20%	It has made us more efficient by cutting down the costs of trainers and venues for in-person training	efficiency

Table 1: Benefits of blended learning

So we can see that more NS using blended learning are reporting access and quality benefits but fewer have evidence of increased efficiency.

Challenges of blended learning

Of course, blended learning is not without its challenges and these fall into two main areas: skills and technology.

Skills in blended learning

Different organisational procedures and processes as well as teaching and learning approaches are needed for blended learning. Therefore National Societies will need to ensure that both managers and administrators as well as trainers and instructors are trained in this new approach. There is evidence that if instructors are not brought on board it can prevent effective integration of blended learning. In Section 5 we will discuss possible resistance to the change from instructors and trainers.

Learning from National Societies

British Red Cross advises NS to first work with trainers and have them use the app in face-to-face courses before moving on to a blended approach. It is important to ensure that trainers are familiar with the content and comfortable with the technology.

One of the main impediments is lack of buy-in from senior management. Blended learning is most likely to be successful when it is driven by vision from the top and guided by strategic objectives. But senior managers have to first understand the potential and processes of a blended approach for first aid training and that sensitization often falls to the educators.

Technical Challenges

Technical challenges include funding and resourcing for ICT infrastructure as well as for hiring or developing staff or contractors with the required skill-set. National Societies who are working in a context where power supply and internet service are not stable will face greater challenges.

Technical capacity for digital training

Just over half the NS in our survey (51%) reported that they had in-house technical expertise to customize the first aid app in partnership with GDPC or used a combination of internal and external technical services to customize the app (37%). This indicates that there is a certain level of technical expertise to support the greater integration of technology in training. 26% of respondents noted that the app was challenging to localize.

Learning from National Societies

The **British RC** were particularly vocal about the challenges they face in institutionalising blended learning;

- We are getting very little traction with blended learning from our commercial delivery arm as we have approached it from effectiveness/increased audience access perspectives. The commercial division while obviously interested in high quality (net promotor) are not inclined to overhaul the way they deliver their courses unless there is evidence of increases in revenue.
- There are huge challenges with how you schedule blended learning courses as the demand may be quite low and when you have a national offer it is not cost effective to run with few people in a course. But the people who are on a blended learning course shouldn't just join a regular scheduled course. They need their own bespoke course.

Measuring effectiveness

In order to answer this question, '*is blended learning effective*?', we need to identify the indicators of effectiveness – which takes us back to the drivers of blended learning and why NS decide to take this approach. If the primary motivation of the NS is to increase the number of people coming for first aid training and increase training revenue, then measuring growth in student numbers and income is one way to measure effectiveness.

In Section 6, on BL implementation the importance of developing strategic objectives and a digital learning strategy is stressed. It is a good opportunity when engaged in strategic planning to identify indicators of effectiveness, based on the drivers for implementing BL.

4. Blending with the First Aid App

- *What are the benefits of mlearning?*
- *How are NS blending the First Aid App into training?*
- *What lessons have NS learned?*

The modern age of mobile learning sparked by the smartphone and tablet is now over a decade old, and students and teachers today rely on their mobile devices as a vital part of the entire learning experience. As mobile devices become more powerful and affordable, and as ownership reaches ubiquity in many countries, the possibilities for engaging learning experiences are becoming limitless[11].

App-based training is delivered on smartphones and tablets. These handheld advanced mobile communication devices enable users to access training information, track their progress and complete training modules prior to, during or after an in-person training session. In some cases, the app-based training is conducted as a standalone activity.

The use of ICT is recognized as a strategic platform affecting the development and training of health workers[12]. Countries with health worker shortages can effectively scale up specific cadres of health workers in response to contextual needs using technology-based learning[13]. Consequently, mobile digital education (mlearning) has been cited as a potential solution to increase health workforce training, including lay workers such as first aid responders, as it offers an opportunity to wide access, low cost and flexibility in response to learners' needs[14].

Software applications used on mobile devices (apps) have been shown to deliver critical health information, support better clinical decision-making and improve patient outcomes. The user-friendliness, convenience and effectiveness of apps in promoting better health outcomes are acknowledged by health care professionals [15].

App-based learning can enhance learner motivation and result in higher levels of engagement with the content. However, due to the individualized learning approach, it limits learner-to learner (peer) interaction and learners are more likely to lose track of time due to their engagement with the content[16]. App-

---

[11] Alexander et.al. 2019
[12] Masys D.R. (2002)
[13] Crisp, N., Gawanas, B., & Sharp, I. (2008)
[14] Dunleavy G. et al. (2019)
[15] Ventola C. L. (2014)
[16] Lee M. K. (2015)

based learning especially with interactive audio and visual information can facilitate access to clinical and non-clinical information[17]. In first aid training, this can enhance learners' comprehension of the content and confidence when faced with real-life emergency situations.

Mlearning offers learners opportunities for better engagement with content through video-based activities and participation in online forums therefore holding the interests of learners over a longer period in comparison to traditional training methods. Other advantages of mlearning include wider access to content, convenience for learners, ability to self-assess, developing additional learners' skills by promoting access to online course-related enrichment content, ability to learn about solutions to health problems in other contexts, convenient access to information to effective decision making for clinicians and in some cases use of data analytics on mobile devices to track progress [18,19]

Benefits of mlearning

JISC – the UK membership organisation providing digital solutions for education and research – provides an [overview of the benefits of mlearning](#).

- Personal, private and familiar (reduces perceived barriers to learning)
- Pervasive and ubiquitous
- Fits into the lives of learners (allows for productive 'dead' time – eg when travelling or queuing)
- Portable – allow anywhere, anytime learning
- Allows access to learning by those in dispersed communities and isolated situations
- Contextualisation through location-aware features such as GPS
- Allows data to be recorded and learning processes captured wherever they happen
- Access to trainers and other learners on-the-move
- Perceived as an acceptable way for learners to receive reminders and chasers – and to manage their time
- Bite-sized elearning resources can be delivered to learners (especially useful for basic skills learning)
- Peer-to-peer networks make learning more student-centred
- Promotes active learning
- Encourages reflection in close proximity to the learning event
- Reduces technical barriers to elearning

---

[17] Kamel-Boulos, M.N., Giustini, D.M., Wheeler, S. (2016)
[18] Leveraging the Use of Mobile Devices for Training in Healthcare Domain. (n.d). G-CUBE.
[19] Walsh K. (2015)

It's clear that there is a growing number of benefits of mobile learning confirmed by the reports from National Societies that this is a growing expectation amongst trainees – that they should be able to learn first aid from their mobile device.

Blended app-based learning in National Societies

Nearly one hundred NS are using the GDPC First Aid App or a similar app they have developed themselves, such as American RC and Netherlands RC. In most cases, the app is not fully integrated into a blended approach to training but is used for self-directed learning (British RC, American RC), is integrated into classroom-based learning (Canadian RC) or as a reference or refresher tool (Netherlands RC). There are some examples of the First Aid App being effectively blended into training.

The main motivation for persons seeking first aid training in Switzerland is to fulfil the legal requirement to obtain a driving licence so there are large numbers seeking certification. Many of these people are young adults and the gamification approach is relevant for their training needs and expectations. So the **Swiss RC** has developed an app-based first aid game and integrated it into an 8 level learning pathway used in conjunction with the First Aid App.

Learners complete 3 hours of theory learning using the game and the First Aid App. They then take a test which must be passed successfully in order to qualify for the 7 hour face-to-face practical skills training.
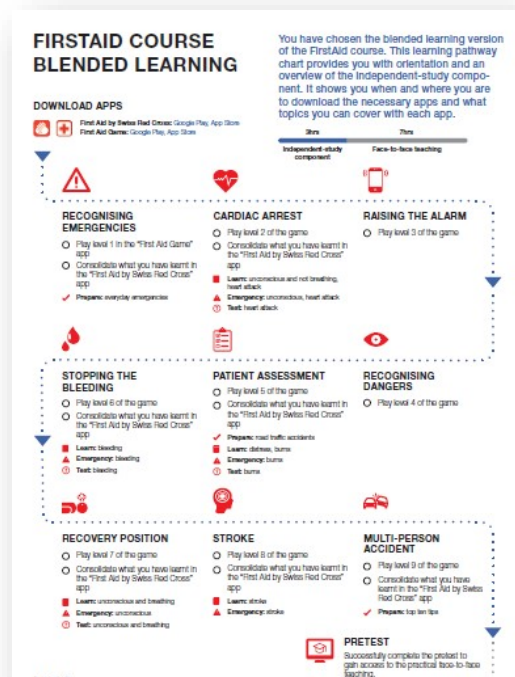
First aid trainees at the **New Zealand RC** can choose between the First Aid App and online learning for pre-course learning which offers a high degree of flexibility for the learner. Both options reduce the classroom training time by half. The cost to participants is the same whichever option is chosen. There are 14 badges in the app which learners must achieve before they can sign up for the classroom based practical skills training. The badges need to be reviewed by an Instructor before the practical training.

In the **Netherlands RC**, they do not use the GDPC app but have developed several apps of their own and have useful experience to share. In particular, their first aid app includes automatic prompts to users as a push notifications and quizzes to practice and test their first aid knowledge. The frequency of the prompt is contingent on the results of the last test. NLRC are now developing a new first aid app with personalised tests based on previous achievement.

The first aid app is not currently integrated into the blended learning programme but NLRC are considering the use of the app for on-the-job training for volunteers. It is mainly used as a refresher and reference tool.

Challenges of mlearning

Despite the appeal of mlearning, trainers and learners can face several challenges that risk affecting learning in some cases. These include hardware and data costs, access to wireless networks, learner distraction, superficial learning which inhibits internalization of knowledge, trusting information sources, and the potential blurring of personal and professional boundaries on the devices[20,21]. National Societies need to consider these potential drawbacks and plan to mitigate them according to what is possible and workable in their country context. In particular, superficial learning can be addressed by great engagements between learners and instructors and more detailed testing.

Challenges of using the First Aid App

Four main challenges are reported by National Societies regarding the use of the First Aid App:
- the inability to know who is getting the training due to its self-directed nature
- lack of functions for tracking and reporting learning
- high costs of data preventing people from accessing the app
- preference for in-person training instead of learning from technology

Learning from National Societies

The **British Red Cross** reports: '*We have very little knowledge of who is using it, how they are using it, the effectiveness of the learning experience, or whether they go on to use their skills. It makes demonstrating to senior leadership the value of self directed (or blended) learning very challenging*'.

---

[20] Harun M.H. (2001)
[21] Mohapatra D.P, et al. (2015)

5. A framework for implementing blended learning

- *How to approach the implementation of blended learning?*
- *What motivates NS to use a blended training approach?*
- *What are the barriers to introducing blended learning?*

Introducing blended learning is an exercise in organisational change which is best approached with the use of a framework to guide the process. Here Lewin's work on field theory and the 3-step change model[22] is helpful. There is a set of resources on the application of Lewin's model in Section 8.
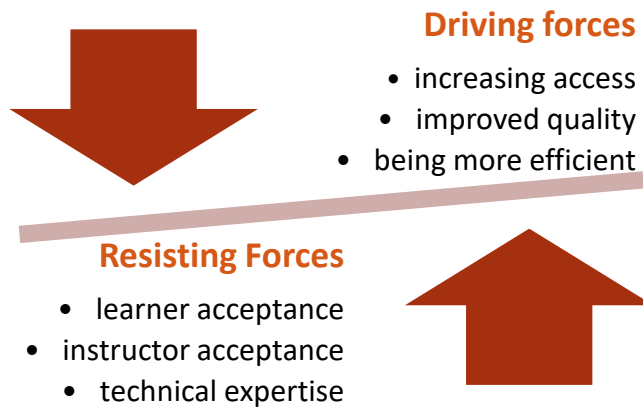
Lewin proposed that identifying the driving and restraining forces on any desired organisational change provides a framework which can guide strategic planning for blended learning. Lewin proposed that in any organisational change process there are opposing forces in play which he called driving and restraining forces. The driving forces push or drive the change forward, the restraining forces push back against the change aiming to maintain the status quo. This process must be recognised and managed by NS managers.

Driving forces
Positive forces for change

Resisting Forces
Obstacles to change

Driving and restraining forces for blended learning

It is valuable for NS to consider what is driving their plan to adopt blended learning and also to consider any aspects of their society's operations or context which may work against this change. Once these factors are identified, a strategy can be developed to build on the driving forces and manage the restraining forces. In this section, we consider what some of the driving and resisting forces might be – but we stress, these will vary in different NS contexts.

---

[22] Lewin 1951

Driving forces

- increasing access
- improved quality
- being more efficient

Resisting Forces

- learner acceptance
- instructor acceptance
- technical expertise

Drivers of blended learning

Increasing access

A blended learning approach can enable National Societies to reach more people by making their training offering more flexible to meet the needs of learners. Rather than offer only in-person training, flexible technology-enabled learning, combined with a shorter period of in-person training enables people to fit training into their busy schedule. This is particularly attractive to adults who have many competing calls on their time.

Using technology for some of the content learning combined with instructor-led practical and assessment sessions can contribute to improved learning outcomes. Elearning offers a range of features such as games and badges, combined with a mix of media to include text, photographs, videos and quizzes which help to keep trainees engaged and promote active learning. Mobile devices also offer opportunities for expanding social aspects and gaming approaches to learning. This is particularly attractive to younger adults and children who may have grown up with this form of learning at home, at school and in their personal life.

Learning from National Societies
The primary motivation for most of the NS currently engaged in blended learning was to increase access and attract more people to first aid training. Because First aid training plays an important role in generating income for National Societies any increase in the number of people taking up training results in an increase in revenue.

Improving efficiency

One definition of efficiency involves achieving the same outcomes for a reduced cost of inputs. Replacing some of the contact time with technology-enabled learning means training duration can be reduced which may mean qualified trainers can train more people in a shorter time, Depending on the model of first aid training, there could be a reduced cost of instructor time and cost of hiring venues for in-person training.

Blended learning for first aid can enable organizations to deliver consistent quality through standard modules especially if training is required in multiple locations. Organizations can save costs by conducting shorter hands-on sessions to reinforce skills and knowledge. In addition, providing content online provides learners with the flexibility to access content at their own pace and time therefore individualizing the learning. Learners can also engage in interactive exercises through video clips and computer generated animations to improve understanding and content retention[23].

In all countries, first aid training makes a substantial contribution to annual income so if the cost of training can be reduced (venues, staff time) then revenue from training fees may be maximised and there may be efficiency gains.

Learning from National Societies

New Zealand RC, whilst not having increased income as a driver of change to a blended model noted that it has been an unplanned outcome. '*The same learning outcomes can be achieved with less instructor time – which results in approximately 25% cost savings and higher profit margin on first aid training*.'

NZRC also noted that the prime motivation for people to attend first aid training is due to employers' needs to meet government requirements for businesses. A blended offering means that learners can reduce the time away from the workplace whilst gaining first aid certification which is an efficiency advantage for the employer.

Economy of scale

Here it is important to note an issue raised by the **Belgian Red Cross Flanders** in relation to their work with NS in African countries. If there are large numbers of people seeking first aid training then some form of resource based learning combined with face-to-face training can help to make training more affordable. Reducing the time that trainees spend with instructors in physical training venues by providing for independent but supported learning in advance can help the NS to reduce the costs of instructor time and training venues. Blended learning also helps to mitigate the opportunity cost for someone who may have to give up their productive work time to attend first aid training.

---

[23] Rowe B. (2010)

This is part of what motivated the Belgian RC Flanders to work with partners in developing countries to create the African First Aid Materials (AFAM). AFAM is a set of print-based first aid training resources in use in countries such as South Africa and Rwanda. Here, quality assured content can be made available for training even if there is no qualified instructor and the materials can be used over and over again for subsequent classes of trainees.
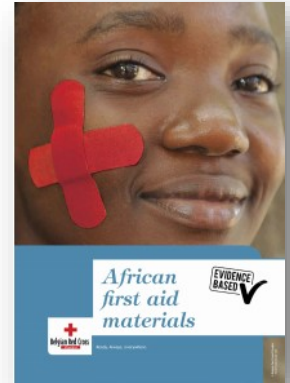
Improving effectiveness

One of the most important considerations for adopting a new training approach is evidence of effectiveness. Almost all NS reported that measuring learning outcomes and the effectiveness of first aid training is challenging.

There is some evidence of the effectiveness of blended learning from a comparative study carried out by the British RC in their exploration of new training strategies. BRC piloted blended first aid training and compared its educational effectiveness to a traditional face-to-face course as a control group. They concluded that blended learning is a viable effective delivery method. They found that learners' knowledge and confidence was improved in both groups. Learners felt that the blended learning pathway was well-structured and that having the online session before their face-to-face training was the optimum order for their learning. This gave several benefits for the learners:
- they had more confidence and understanding when they arrived at their face-to-face session
- they had time to reflect on the online learning and prepare questions about what they had seen for the face-to-face session
- the face-to-face session itself was used effectively to reinforce – rather than repeat – their learning from the online experience.

Results of an evaluation study measuring the effectiveness of blended learning course for front line health care professionals in Ethiopia found blended learning to be an effective pedagogical approach enabling hands on training while keeping costs low and reaching a wider number of participants [24].

Consistency of content

Resource based learning – whether it is print based or digital, provides an opportunity to have content that is written by experts and made available to everyone as we saw in the case of the AFAM resources. This is particularly useful in contexts where there is a lack of trained instructors. If trainees are learning

---

[24] Manyazewal T. et al. (2017)

from digital online or app-based content then the NS knows exactly what content they are getting. This is not always the case with distributed models where first aid is offered through external training partners or commercial providers.

Learning from National Societies

What motivates NS to develop a blended training model?

Most of the NS engaged in blended learning noted the desire to increase access to training as a motivational factor:

Belgium RC Flanders noted the ability to scale up first aid training when there is increased demand;

British RC talks of democratization of training and making it available for everyone who wants it;

Canadian RC noted that this approach can help the NS to reach people who would not otherwise engage in training;

Swiss RC stated their main aim was to increase the number of people taking up first aid training.

Restraining forces in blended learning

Identifying restraining forces helps in identifying the areas where we must concentrate in order to reduce risks to successful implementation of blended learning. These are the areas where support and strategy are needed.

The main resisting forces that emerged from the study align to what is often seen in other education and training contexts such as; perceived learner preference for classroom based approaches, instructor resistance to blended learning and a lack of technical expertise and resources for blended learning. It should be noted that in different contexts a resisting force may be or become a driving force.

Learner preference for in person training

Even though learners like the increased flexibility of digital learning opportunities because it better fits into busy lives, they often choose a face-to-face training if they have the option. There seems to be an ingrained model that teaching and learning takes place in a room with a teacher. It's how most adults completed their schooling and post-secondary education.

There is also a tendency for learners to give up the responsibility for their learning to their teachers. And teachers who enjoy teaching and are also measured on their class completion rates are happy to take up that responsibility. What we have learned about effectiveness in teaching and learning is that when learners take responsibility, actively seek out and engage with their own learning experiences, they are more likely to be successful. This is why a blended approach can help to achieve a 'happy medium' whereby part

of the learning must be self-directed from digital learning content and p[art of the training is done in a face-to-face context.

Instructor resistance

Teachers and instructors can be resistant to the introduction of more technology into their classroom for several reasons which may include:

- they enjoy teaching. A blended model requires a teacher to change their role to become more of a 'guide on the side' rather than the 'sage on the stage'.
- they are not comfortable with technology and fear they will not understand it and may look foolish.
- they fear a reduction in their income if instructor training time is reduced. This is a real fear but can be mitigated by blended learning as it enables more people to be trained if the model is managed well.

It is interesting to note that in the survey, 93% of respondents reported having trainers who are willing to learn new methods as part of their plan to deliver a blended training model using the first aid app.

Respondents talked about the key role of the training in blended learning that they have provided for their instructors. Some NS have developed digital portals to provide support and additional learning resources for their instructors. The Canadian RC has *Boulevard* and the American RC has *Instructors Corner*. Other NS such as the Swiss RC provide a similar portal where instructors can download training materials, workbooks, session plans and presentation slides. This encourages instructors to integrate digital resources and the First Aid App in a blended approach.

Lack of technical expertise and resources

Access to the technology is a critical success factor for both instructors and learners. Access does not just mean physically having access to a smartphone and airtime, or a laptop and the internet, (and a stable source of power) but also having the skills to teach and learn with technology. These skills need to be developed and both instructors and learners need some support and guidance in this area.

Several NS commented that they would like to engage in blended online learning but suffer from a lack of financial and technical resources. This is a very real issue which must be addressed. This requires NS to rethink their strategic plan and include development of digital infrastructure and skills as a strategic objective. According to GSMA[25], there were 5.1bn unique mobile subscribers in the world in 2018 – that's a 67% penetration rate. A list quantifying the mobile penetration rate for different countries can be found here.

---

[25] https://www.gsma.com/

So it is increasingly likely that learners will have a smartphone available for learning and this is why app-based blended learning is more attractive and accessible to the majority of NS.

6. Planning for blended learning

- *How to test readiness for blended learning?*
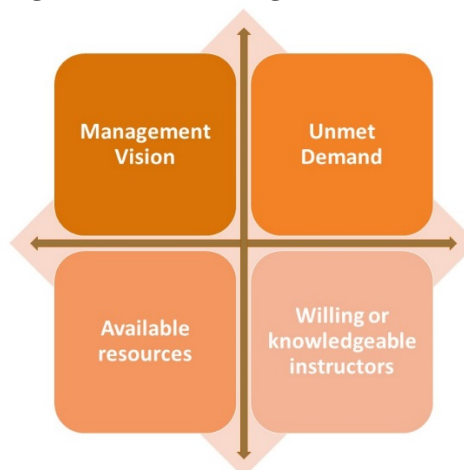- *How to plan for blended learning?*

Readiness for blended first aid training

Experience of advising on the planning and implementation of blended learning indicates that there is a set of readiness factors which are best addressed at the earliest planning stage.

Readiness Indicators

There are four basic indicators that show if an organisation is ready for blended learning. These include:

1. Management vision for a blended model in the future training offering of the NS. This should preferably be evidenced in the strategic plan or there should be an intention to do so.
2. Evidence that there are more people wanting first aid training that are currently being reached and that the target learner-demographic would respond well to technology-enabled learning.
3. Resources available for technical infrastructure and capacity building in blended learning, including human resource.
4. Instructors and technical support staff who are knowledgeable in blended learning or who are willing to learn.

This is, in part, confirmed by the advice offered to NS from the Swiss RC.

- Start with a digital learning strategy for the NS
- Make sure instructors are brought on board at the beginning and plan for blended learning with their input

Planning for blended learning

As you might expect, the four readiness indicators are the first place to start in a plan for blended learning.

Management Vision

Organisational managers must drive the change to blended learning either through their own initiative or through mobilisation from education staff and instructors. They should be not only 'on-board' with the change but be prepared to ratify it in strategy and ensure adequate resourcing. The resources are needed for both human and technical components of blended learning.

The inclusion of blended learning in the Strategic Plan may be based on a digital learning strategy which is developed with the input of all stakeholders who might include instructors, technical and administration staff . All have a role to play. Some organisations include representatives from different target audiences and test their ideas at the planning rather than implementation stage.

Unmet demand

It is important to make a business case for blended learning which quantifies the expected demand from different groups of trainees as well as the cost of resources (human and technical) to meet that demand. The business case can be phased over a number of years and may involve different and developing models of blended learning.

It may be necessary for NS to carry out some market research in order to measure any unmet demand. This is not without its own challenges and cost-implications but may enable savings in the longer-term. Another approach (which has been used with some success) is based on the philosophy – '*build it and they will come'*. Technology adoption in education and training is sometimes a political rather than researched decision. Better results are achieved when the need for technology-enabled learning is demonstrated before adoption.

Available resources

Once the strategic plan and costed business plan are in place, a full implementation plan should be developed to acquire the needed ICT infrastructure, staff with technical skills, instructional skills and any new organisational structures required. Larger NS might consider establishing a Digital Learning Unit/Team.

In their [Blended Learning Toolkit,](#) the University of Florida offers a list of areas to be resourced for blended learning implementation. Investment may be required in the following areas to build, deliver, and assess blended learning:

- technology infrastructure
- incentives (staff) or fees (contractors) for elearning course design
- release time for staff training
- professional development
- evaluation support
- instructional design
- media production services
- technical help desks
- learning management systems or other learning technologies[26]

It is not possible to specify a list of ICT infrastructure as dependent on the size and context of the NS and their vision and plan, resource needs will vary. One size does not fit all.

Willing or knowledgeable instructors

As explained in Section 5 on the framework for blended learning implementation, it is possible for resistance from instructors and trainers to derail even the most detailed plans. It is therefore important to ensure participatory planning for blended learning and take their concerns and needs into account at an early stage in the process.

Instructors need to develop skills in the use of the First Aid App or online learning and most importantly, how this is integrated into classroom sessions to facilitate effective learning and achievement of planned learning outcomes. If the Digital learning Strategy indicated online learning then the skills required will be greater than a mobile or app-based model.

Critical Success Factors

From experience of implementing blended learning, a set of critical success factors have been identified and it is advised that National Societies pay attention to, and plan to achieve, these.

A commonly understood definition among stakeholders for 'blended learning'
As part of the Digital Learning Strategy of the NS, stakeholders will define blended learning in their own context and to reflect their plans for blended first aid training. This shared vision of blended learning is critical for successful change.

---

[26] University of Florida

A blended learning strategy that aligns with institutional goals
It is important that a national Society only takes on blended learning if it helps to achieve the strategic objectives of the organisation. It is likely that most NS have a goal to attract more learners to first aid training so blended learning has potential to be a good fit with organisational strategy.

An effective organizational model to support the blended learning initiative
Attempts to offer blended learning without considering organisational structures and staff capacity are not likely to achieve the desired results.

Trained technical staff to support managers and instructors
App-based blended learning requires re-thinking how the First Aid App is used, guidance given to trainees, how knowledge is tested and how this is integrated into face-to-face training. Support for the use of new technology and new teaching and learning approaches will be needed.

Online student support services to support blended learning
A major consideration in any form of distance learning is how to provide channels of support for learners so they can get assistance if they need it. Mobile technology provides many opportunities for support channels which may be voice, text or even video. But learner support skills must be developed in key staff. Larger NS will require dedicated learner support staff. We should also not assume that learners have the study skills needed to learn effectively form technology. Some may require guidance on successful independent study.

An instructor training program to prepare staff to teach in a blended approach
Blended learning isn't about just adding in some technology-enabled learning. Effective blended learning requires a re-thinking of the teaching and learning process and how learners are guided and facilitated to achieve their learning goals and achieve certification. NS will need to put a mechanism in place to ensure that all trainers involved in blended learning have relevant skills as part of their standard instructor training program.

An evaluation program to assess the impact of the blended learning initiative
There will be expectations of certain results of blended first aid training from NS management, which will be set at the strategic planning stage. An evaluation system should be developed as a component of the initial instructional design phase. Results will be based on the driving factors for taking up blended learning.

ROI calculated based on resources dedicated to the blended learning initiative
Likewise, the cost of the blended training programme should be carefully monitored and measured against relevant indicators and costs of traditional training. Only armed with this information can decisions about efficiency and effectiveness be made.

Reusable courses and learning resources shared between National Societies engaged in blended learning
National Societies throughout the RC/RC network could benefit by publishing their courses as Open Education Resources (OER).

Amongst those NS already using a blended approach, the main driver was noted as a strategic objective to move towards a more flexible training offering. The planned outcomes were to better meet the needs of trainees and in doing so to attract more people to first aid training.

A little over half (56%) respondents state that their NS do not have strategic plans to develop digital first aid training and only 22% reported the inclusion of digital training as a strategic objective. However, 65% of NS are considering online or blended learning for First aid training despite lack of strategic objectives and plans.
Comments included:

- We are striving towards more blended learning in all of our training, not just First Aid. By the end of the year we will be implementing a new LMS to help us move further. We have developed a digital First Aid-course, which will be combined with a physical course.

- we are trying to find a solution with one IT company to establish an online training course for FA

- We are trying to develop an online platform for students to learn all the theory anytime anywhere

- it is mentioned in the Strategic Plan that the eLearning courses should be promoted.

- Not specifically in the training, but digital technology should be used for making people aware of first aid training. Secondly as a supplement the in-person training.

- We are committed to continually exploring a variety of educational technologies (used by learners for self-direct learning or by facilitators as teaching tools) and their relation to FA educational learning outcomes.

- First aid training is specified in our Strategic Plan and so is the use of technology to build up staff and volunteers' capacity.

- We are considering blended learning, but until now why haven't found a way of combining it with our aim to earn money

Advice from National Societies using a blended model

The blended learning story of each of the six NS who are using a blended approach is presented in a companion document to this Guide – Cases of Blended First Aid Training in Red Cross National Societies. The NS in our case studies have been developing their blended approach over several years and have learned valuable lessons to share. They offer the following advice to those NS considering a blended approach.

American RC
- Know your audience and their needs for the training.
- Any blended learning offering must work on mobile devices
- Accessibility for persons with disabilities is important

Belgian RC Flanders
- work on systems and processes to become ready for blended learning
- adapt existing resources such as the AFAM materials and GDPC First Aid App to ensure quality and consistency of content in blended learning
- Look for cost efficiencies through economies of scale to ensure first aid training generates income
- Learn about blended learning from other NS and get inspired!

British RC
- Start small with trainers using the app in face-to-face courses
- Ensure trainers are familiar with the content and comfortable with the technology.
- Remember the app is designed as a self directed learning experience so think carefully about how you design a blended learning experience that enhances the qualities of the app and best uses the strengths of a face to face course.

Canadian RC
- Start by identifying your goal for using the tool (learning outcomes, scalability, etc...) so that you are able to measure change and recognize return on your investment.
- Consider why you would use the app in place of other blended offerings.

Netherlands RC
- Integrate a mechanism for retention of knowledge into the app
- Don't under-estimate the training some people need to be able to learn effectively using a phone
- There is a limit to what content you can include in elearning – a blended approach is better
- Make sure you do developmental testing – an effective method is to sit next to different users while they test the app and gather their impressions

New Zealand RC
- The app is loved by its users and is transforming our first aid business
- Our users share this lifesaving information with friends and family in a way we have not been able to achieve with traditional training
- This has become one of NZ Red Cross's most powerful tools of engagement outstripping many other channels.

Swiss RC
- Start with a digital learning strategy for the NS
- Make sure instructors are brought on board at the beginning and plan for blended learning with their input

A model of blended learning for National Society using the First Aid App

Consideration of the existing app-based blended learning approaches in use in National Societies points to a simple 3-part model where learners engage In independent study using the app, then take a knowledge test to assess what they have learned. A high pass rate (80%) is set to qualify to register for in-person skills training and be assessed for certification.
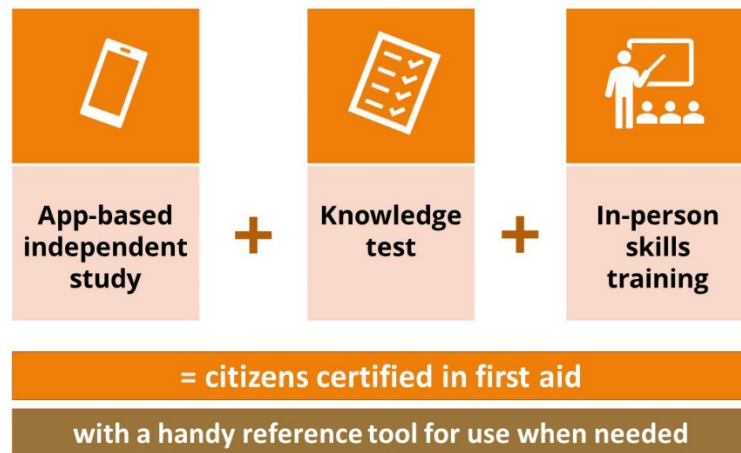
An important part of the model is that the First Aid App, if referenced and managed properly, forms an integral part of the on-going relationship between the NS and the trainees. This has been successfully demonstrated by the NZRC. There is also evidence to show that even certified people are more confident when faced with a first aid emergency if they are quickly able to check their knowledge on a handy reference tool.

7. Resources for Blended Learning

Resources on practical implementation of blended learning

To learn more about blended learning and how to plan and implement a new blended approach, here is a list of practical resources with concrete strategies to consider.

Bates, A.W. & Sangra, A. (2011) Managing Technology in Higher Education; strategies for transforming teaching and learning. San Francisco. Jossey-Bass.

Boase, C. (2018). Measuring education outcomes – arguably the single most important step in advancing the first aid education evidence base. Global First Aid Reference Centre (GFARC). Outcomes Project.

Cleveland-Innes, M. & Wilton, D. (2018) Guide to Blended Learning. Commonwealth of Learning. 05 April 2019 Retrieved from http://oasis.col.org/handle/11599/3095

Lewin, K. 1951. Field Theory in Social Science, edited by D Cartwright. New York: Harper & Row.

Wang, Y., Han, X., & Yang, J. (2015). Revisiting the Blended Learning Literature: Using a Complex Adaptive Systems Framework. Educational Technology & Society, 18 (2), 380–393. https://www.researchgate.net/publication/282686856_Revisiting_the_Blended_Learning_Literature_Using_a_Complex_Adaptive_Systems_Framework

Toolkits

Inevitably, these toolkits come from higher education. But they still provide useful, practical steps for blended learning.

Blended learning Toolkit – University of Central Florida. CC BY-SA-NC https://blended.online.ucf.edu/

The Blended Flow Toolkit for Designing Blended Courses – Seattle University https://library.educause.edu/resources/2018/1/innovating-with-purpose-the-blended-flow-toolkit-for-designing-blended-hybrid-courses

Mobile learning: A practical guide for educational organisations planning to implement a mobile learning initiative – JISC https://www.jisc.ac.uk/guides/mobile-learning

Online Skills Mastery – open course from the University of Denver https://ucdenver.instructure.com/courses/354652

Select Bibliography

A list of resources from the academic research literature to inform thinking about blended learning.

Alexander, B., Ashford-Rowe, K., Barajas-Murphy, N., Dobbin, G., Knott, J., McCormack, M., Pomerantz, J., Seilhamer, R.,& Weber, N. (2019) EDUCAUSE Horizon Report: 2019 Higher Education Edition. Accessed on May 20, 2019 at https://library.educause.edu/resources/2019/4/2019-horizon-report

Boase, C. (2018). Measuring education outcomes – arguably the single most important step in advancing the first aid education evidence base. Global First Aid Reference Centre (GFARC). Outcomes Project.

Busick, J. (2015). New Red Cross Research Shows 4 Benefits of Blended Learning. Accessed on May 24, 2019 at https://ehsdailyadvisor.blr.com/2015/02/new-red-cross-research-shows-4-benefits-blended-learning/

Blended Learning: Getting the Best from Instructor-Led Training and E-Learning. (n.d). G-Cube. Accessed on May 24, 2019 at https://www.gc-solutions.net/resources/articles/blended-learning-getting-the-best-from-instructor-led-training-and-e-learning.html

Crisp, N., Gawanas, B., & Sharp, I. (2008). Training the health workforce: scaling up, saving lives. The Lancet, 371(9613), 689–691. https://doi.org/10.1016/s0140-6736(08)60309-8

Dunleavy, G., Nikolaou, CK., Nifakos, S., Atun, R., Law GCY., Tudor Car L. (2019). Mobile Digital Education for Health Professions: Systematic Review and Meta-Analysis by the Digital Health Education Collaboration. Journal of Medical Internet Research. Accessed on May 20, 2019 at https://www.jmir.org/2019/2/e12937. DOI: 10.2196/12937

Garrison, D.R., & Kanuka, H. (2004) Blended learning: uncovering its transformative potential in higher education. Internet and Higher Education 7 (2004) 95 – 105. Accessed May 19, 2019 at https://www.sciencedirect.com/science/article/abs/pii/S1096751604000156

Harun M.H. (2001). Integrating e-Learning into the Workplace. The Internet and Higher Education. 4(3-4), 301-310. Accessed on May 24, 2019 at https://www.sciencedirect.com/science/article/pii/S1096751601000732.

ITU. (2017) Measuring the Information Society Report 2017. 23 April 19, retrieved from: https://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2017.aspx

Kamel Boulos, M.N., Giustini, D.M., Wheeler, S. (2016). Instagram and WhatsApp in Health and Healthcare: An Overview. Future Internet. 8(3), 37; https://doi.org/10.3390/fi8030037 . Accessed on May 31, 2019

Kho M.T.H, Chew K.S., Azhar M.N., Hamzah M.L., Chuah K.M., Bustam A., Chan H.C. (2016). Implementing blended learning in emergency airway management training: a randomized controlled trial. BMC Emergency Medicine. Accessed on May 22, 2019 at DOI: 10.1186/s12873-018-0152-y

Lee M. K. (2015).   Effects of Mobile Phone-Based App Learning Compared to Computer-Based Web Learning on Nursing Students: Pilot Randomized Controlled Trial.   Health Care Informatics Research. 21(2):125-133. https://doi.org/10.4258/hir.2015.21.2.125. Accessed on May 31, 2019.

Leveraging the Use of Mobile Devices for Training in Healthcare Domain. (n.d).G-CUBE. Accessed on May 24, 2019 at https://www.gc-solutions.net/resources/articles/leveraging-the-use-of-mobile-devices-for-training-in-healthcare-domain.html

Liu Q, Peng W, Zhang F, Hu R, Li Y, Yan W. 2016. The Effectiveness of Blended Learning in Health Professions: Systematic Review and Meta-Analysis. Journal of Medical Internet Research. 18(1):e2. Accessed on May 24, 2019 at https://www.jmir.org/2016/1/e2.

Manyazewal T., Marinucci F., Belay G., Tesfaye A., Kebede A., Tadesse Y., Lehman S., Temesgen Z. (2017). Implementation and Evaluation of a Blended Learning Course on Tuberculosis for Front-Line Health Care Professionals. American Journal of Clinical Pathology. 147(3), 285-261. Accessed on May 24, 2019 at https://www.ncbi.nlm.nih.gov/pubmed/28395055.

Masys D.R. (2002). Effects of Current and Future Information Technologies on Health Care Workforce. Journal of Health Affairs. 21(5); 33-41. Accessed on May 24, 2019 at https://www.healthaffairs.org/doi/10.1377/hlthaff.21.5.33

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2010) Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies. U.S. Department of Education. Accessed 5 June 2019, retrieved from https://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf

Mohapatra, DP., Mohapatra, MM., Chittoria, RK., Friji, MT., Kuma,r SD. The scope of mobile devices in health care and medical education. Int J Adv Med Health Res [serial online] 2015 [cited 2019 May 24];2:3-8. Available from: http://www.ijamhrjournal.org/text.asp?2015/2/1/3/159113

Oliver E., Coleburn D., Taylor H. (2016). How Effective is Blended Learning for First Aid Education? Official Journal of the European Resuscitation Council. Accessed on May 24, 2019 at https://www.resuscitationjournal.com/article/S0300-9572(16)30292-1/pdf.

Rowe B. (2010). Using Blended Learning for CPR, AED, and First Aid. Occupational Health and Safety. Accessed on May 31, 2019 at https://ohsonline.com/Articles/2010/02/01/Using-Blended-Learning-for-CPR-AED-and-First-Aid.aspx?Page=1

Zajic P., Hallmann B., Heschl S., Metnitz P., Rehatschek H., Schorghuber M., Prause G. (2016). Teaching CPR and first aid using blended learning: Experiences from a novel academic course at a medical university. Official Journal of the European Resuscitation Council. Accessed on May 24, 2019 at https://www.resuscitationjournal.com/article/S0300-9572(16)30293-3/abstract

Ventola C. L. (2014). Mobile devices and apps for health care professionals uses and benefits. P & T : a peer-reviewed journal for formulary management, 39 (5), 356–364. Accessed on May 24, 2019 at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4029126/

Walsh K. (2015). Mobile Learning in Medical Education: Review. Ethiopian journal of health sciences, 25(4), 363–366.Accesed on May 24, 2019 at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4762975/

Glossary

Term	Meaning in use
andragogy	Methods and principles used in adult education
community of practice	A group of people with a passion for something who interact regularly to learn how to do it better
didactic	teaching, lecturing, to convey information
elearning	all forms of learning that are based on electronic devices, both online and offline.
JISC	UK membership organisation providing digital solutions for education and research in higher education (formerly Joint Information Systems Committee)
mlearning	uses mobile devices such as phones and tablets for learning
online learning	elearning including internet access
pedagogy	The art and science of teaching children
technology-enabled learning	learning which is primarily face-to-face being augmented or enhanced with educational technology