Proceedings of ICSPHS 2026 Symposium: Critical Perspectives on Global Education and Psychological Development
DOI: 10.54254/2753-7048/2026.HT31566

Basic First Aid for Campus Emergencies: Mobile Learning Module Design

Yinuo Xiao

Institue of Education, University College London, London, United Kingdom
stnzy73@ucl.ac.uk

Abstract. First aid training on campuses is struggling with low skill retention and poor teaching outcomes. Data shows that only 2% of students maintain their basic first aid skills a year after training. This article tries to solve this problem by designing a mobile-learning module. People on campus can be divided into three categories—freshmen in dorms, lab researchers, and campus first aid responders. Based on Schrock's Communicative Affordances Theory, the author plans to design a location-aware, targeted, and efficient mobile learning module. The design includes three practical modules: an Emergency Assessment Framework that scales from basic assessment to incident-command protocols; a Common Campus Injuries module; and an Advanced Life Support module offering airway management with real-time performance feedback. The author designs the modules based on the concept of Learn-Practice-Assess. The designed learning module is expected to turn spare moments into intentional skill-building. The learning module is supposed to yield marked gains in accessibility and retention compared to other first aid training approaches. The author wishes that when life-saving knowledge lives in students' pockets, competency becomes a habit rather than a forgotten certificate.

Keywords: Campus First Aid Training, Mobile Learning Module, Communicative Affordances

1. Introduction

A set of data illustrates the necessity of basic first aid for campus emergencies. There are 22,212 criminal incidents at U.S. educational institutions in 2023, up 13% from 2022 [1]. Different kinds of accidents such as lab accidents, sports injuries, and severe weather events occur frequently and demand an immediate response.

However, traditional first aid training is struggling with low skill retention and is hard to be of use in emergencies. Research following medical students found just 2% retained competency in first aid [2]. If professional instruction brings these results, conventional campus workshops likely perform worse. The author thinks that the key issue is not initial training but the absence of practice. The author believes there is a gap that mobile technology might fill.

Smartphones that almost everyone has offer timely access to first aid training. The characteristics of mobile learning align with cognition theory that individuals can learn anywhere and anytime. In this regard, the author specifically investigated the related data. Multiple studies, including a meta-

© 2026 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7048/2026.HT31566

analysis, show retention gains of up to 37% over traditional methods with segmented, interval-repeated content [3, 4]. Although the theoretical foundation exists, validation in emergency training remains incomplete.

This article pursues two objectives. First, it aims to identify which Schrock's mobile affordances improve first aid training effectiveness. Second, it seeks to develop a mobile learning module for the above three distinct groups. To avoid designing independent applications for each group, the author will make flexible functional adjustments to ensure the system can meet the specific needs of different groups while maintaining its maintainability.

2. Needs assessment

2.1. Target audience analysis

The author started this project assuming first aid training could follow the same template. Over several weeks of engaging with students and exploring design ideas, the author began to question that assumption. The author found that the needs on campus fracture into three distinct camps with almost no overlap.

First, there are the freshmen, roughly 35% of the student body. Most live in dorms, play sports, and have never taken a first aid class. Their concerns are immediate and practical: a sprained ankle at an intramural game, a cut in the dining hall, what to do if a roommate passes out. When the author showed them early prototypes, they consistently chose interactive scenarios and gamified drills over video lectures. As one put it, "If it's not somewhat fun, I'll just panic and call 911 anyway."

Lab researchers account for 20% of the campus students. And they face totally different risks. Chemical exposures, equipment malfunctions, and lab-specific hazards dominate their environment. When the author was conducting interviews with them, their feedback was blunt: "Don't give me generic burn treatment. I need a step-by-step protocol for sodium hydroxide in the eye." Based on their feedback, it is obvious that what they really need is detailed guides.

The third group is the first aid responders on campus. This group is hard to define. They are resident assistants, club leaders, and student volunteers. And they function as de facto first responders in the campus first aid. They usually want advanced life support training such as AED and airway management. Their other critical need is the decision-making under ambiguity and high-pressure. They want to know when to call emergency services and how to manage crowds.

The needs of the above three groups are different. A learning module that works well for one group will likely fail the other two. Therefore, the author needs to design different functions for different groups. And after assessing their needs, the author will recommend appropriate functions to them. The author wishes the designed module could not only cover the basic first-aid skills for freshmen but also provide professional guidelines for the lab researchers. This really shaped this module’s design philosophy.

2.2. Content requirements

Based on the above needs assessment, the required content can be summarized into three areas:

Minor trauma management addresses the most common campus injuries. Minor trauma are those that might occur in normal campus life. Examples include sprains and bruises from exercise, cuts from cooking, and so on. The module designed should send out tips on preventing and handling these injuries in daily routines. When an injury happens, it needs to promptly assess the condition, advise calling for help, and guide emergency care.

DOI: 10.54254/2753-7048/2026.HT31566

Laboratory emergency schemes focus on the risks present in campus laboratories. This content is designed to include procedures for handling equipment-related hazards, such as chemical exposures and laboratory fires. Unlike "Minor Trauma Management", this content is designed to provide more professional and detailed guidelines for different types of lab injuries. Laboratory safety training is crucial and necessary. A study by Iowa State University shows that from 2001 to 2014, laboratory accidents accounted for 18.4% of all reported incidents [5].

Life-saving techniques are the most critical content area. The author plans to introduce CPR, AED usage, and basic airway management techniques in this module. The author wishes this module could provide stable, clear, and professional support when in urgent and high-pressure situations. These techniques play a vital role in life-saving. Data show that effective CPR can double or even triple survival rates for cardiac arrest victims [6].

The above needs assessments reveal the adaptability and necessity of basic first aid training on mobile devices. A study from 2015 to 2021 shows the growing use of mobile learning in educational contexts [7]. The author believes there are also broad prospects for first-aid training on mobile devices.

3. Media affordances analysis

3.1. Theoretical foundation of communicative affordances

Schrock's Affordances Theory provides the theoretical foundation for the module design [8]. It emphasizes four aspects in the product design, portability, usability, locatability, and multimodality. This article adopts this theory as the framework for the mobile module design. Specifically, for the first-aid training, the four adaptabilities align with students' needs for emergency info, easy use, location-specific details, and diverse media.

Let the author provide examples here to illustrate how these four characteristics are reflected in the design. Portability means that the learning can be carried out during the two-minute break between lectures. Availability refers to the ability of a resident assistant responding to a 2:00 AM crisis to access professional choking protocols. Locatability can help students find the nearest AED anywhere. Multimediality provides audio-only CPR guidance for anyone who needs it.

3.2. Theoretical foundation of communicative affordances

3.2.1. Portability

The average student unlocks their phone 58 times daily.The design targets the 59th time. In the context of first-aid training on mobile devices, what the author really means by “portability” isn’t just that students can open the learning module anywhere, anytime; it’s the idea of bite-sized, on-repeat learning that fits into the cracks of the day. A freshman can skim how to avoid sports injuries between drills; a lab tech can scroll through today’s most likely safety hazards while grabbing coffee on the way to the bench. Those are the moments the author is designing for.

3.2.2. Availability

Availability is for real emergencies. Imagine the students are injured alone in a stadium or laboratory. The injured may be unable to move or bleeding profusely, yet unable to get timely rescue. The module designed in this article exactly addresses this problem. The author hopes that in such cases, the students can seek timely help from the right people through the author’s designed

DOI: 10.54254/2753-7048/2026.HT31566

module. Correcting treatment recommendations can be quickly obtained. The learning module in the pocket may become the key to changing the outcome of the accident.

3.2.3. Locatability

Since campus maps are frequently updated, the author hopes that locatability can be reflected in accurately responding to changes in the maps. The author plans to designate professors, security staff, cleaners, dormitory managers, and student volunteers as administrators who can manually refresh the map. For example they can mark a road under repair as impassable or flag a broken AED. Ordinary students are given a photo-based correction tool. When the manual entries lag, they can upload photos to help relabel the map.

3.2.4. Multimediality

The author believes that the capability of mobile phones to play audio, video, images and text should be utilized. The proposed solution specifies 45-second video clips with adjustable settings, like TikTok. And the author designs the color system (red for urgent actions, green for follow-up steps, white backgrounds) to ensure reliability. The author also designs CPR audio that originated from observing participants attempting compressions to streaming music tempos.

4. Module design and development

4.1. Instructional design architecture

The author intends to design the module based on the Learn-Practice-Assess concept. The author believes that practice delivered in short bursts would be better than traditional workshops. Actually, the real test in first aid training is whether students participate in it voluntarily.

The author believes that short video learning models similar to those on TikTok are very effective. So each learning block runs 1-2 minutes, constrained by cognitive theory [9]. What's more, information chunks build sequentially. For example, basic wound care is before professional trauma protocols. To make the learning process more fun, the author hopes students can see a "skill tree" unlocking during learning.

In the practice and assessment process, immediate feedback is very crucial. The author hopes the practice questions are concise and efficient. The author tries to design some blocks similar to drag-and-drop modules or matching activities (like connecting lines). When a student answers correctly, the module can vibrate and play the correct sound effect. As for the assessments, they can be split into formative checkpoints and summative demonstrations. Formative elements pop up mid-module. And summative tests are planned to be combined with AR. The author tries to map these to certification standards. Many people think it is really interesting and practical.

4.2. Core module structure

4.2.1. Module 1: emergency assessment framework

The author designed this part largely based on the results of the previous needs assessment. The author hopes to provide different first aid training content for three different groups of target groups.

To begin with, people are supposed to get a three-step survey: check for dangers, assess responsiveness, secure help. Through the assessment, the author hopes to understand the specific

DOI: 10.54254/2753-7048/2026.HT31566

role of the respondent—such as whether they are a rescuer or an injured person—the injury scenario (e.g., a sports sprain or a bleeding injury), the severity of the injury, and whether an ambulance is needed. Such information is crucial for determining what kind of assistance the designed module should provide.

For example, after the assessment, first aid responders will see the full ILCOR protocol and incident commands. For those less proficient in first aid, the author hopes to provide them with the simplest, easiest-to-understand, and targeted first aid knowledge.

The author found some situations that had not been expected before the survey. During design feedback sessions, participants tended to provide vague location descriptions ("near the library"). And the voice activation may see low adoption during high-stress situations.

4.2.2. Module 2: common campus injuries

In this module, the author first tailors emergency suggestions for freshmen—such as ankle sprains and concussion checks. For freshmen, the author mainly considers the injuries that may be encountered in daily life and sports. For lab researchers, the content is more professional. For example, it is supposed to include the chemical-exposure scenarios like treating hydrofluoric-acid eye contact and so on. What is more, the author plans to co-write that content with campus safety officers and the chemistry faculty to improve the professionalism and practicality. As for first aid responders, the author focuses more on providing accurate injury management advice, since they are often the ones who handle injuries.

4.2.3. Module 3: advanced life support

The author wishes the content of this module would be accurate and clear. It delivers comprehensive training in life-saving techniques, following the latest European Resuscitation Council guidelines. Users are supposed to learn proper CPR techniques through detailed video demonstrations. To provide a more accurate and effective guide, the author designs the audio guide to provide a compression rate of 100-120 per minute.

Other airway management is also expected in the module. The module includes training on AEDs, teaching users how to operate them correctly. Specialized life support in this module equips users with the capabilities to handle diverse campus emergency situations. But the author hopes this module can never be needed.

4.3. Content requirements

In the UI design section, the author hopes the designed learning module has a clear display and strong color contrast to facilitate reading. Since some first aid scenarios occur outdoors, being able to maintain high brightness under these conditions is also very important. The author chooses red for immediate actions, green for follow-up steps as the main design style. And it was validated through user testing to guarantee visibility. As for the icons, they comply with ISO medical-labeling standards, ensuring that first-aid screens can be recognized instantly.

When it comes to the module's interactivity, the author has also done some thinking. The author hopes to add displayable digital badges to the module and the digital badges align with the above certification standards. The author decides not to set up leaderboards. The author thinks public leaderboards create perverse incentives—students rushing modules for points but retaining little.

DOI: 10.54254/2753-7048/2026.HT31566

Meanwhile, the author holds a positive view of private progress tracking with optional sharing. It increases engagement while avoiding the trivialization of the content.

5. Comparative analysis

5.1. Traditional approaches

Traditional first aid training methods include one-on-one teaching, workshops, first aid lectures, and so on. These approaches still have a lot of merits. There's no substitute for practicing chest compressions on a manikin. And getting immediate corrections from an instructor is always helpful.

But they also have some unavoidable drawbacks. Organizing students to participate in first aid training will take up a lot of their class and rest time. It will reduce everyone's enthusiasm for participation. And there's also the cost. Even a basic CPR/AED certification runs $50–100 per person. For a university of 30,000 students, it will be a huge expenditure.

More troubling is the skill decay curve. Research confirms that skills start slipping within six months, and after a year, most trainees will struggle to perform effectively [10]. Compared with traditional methods, the first aid learning module designed in this article not only has very low costs, but also allows repeated practice. And it can be used as a necessary tool at critical moments.

5.2. Digital alternatives

Using other first aid online training courses avoids the mentioned shortcomings of traditional methods, but the method proposed in this article still has significant advantages over them. First aid online training courses often suffer from poor targeting. For example, YouTube offers visual demonstrations for free, but the quality is alarming. A Turkish team analyzed 209 CPR tutorials and found just 11.5% fully complied with 2010 guidelines [11]. Online courses still assume a stable internet connection. It is obvious that, in respect of locatability, availability, and multimediality, the module designed in this article is better suited to the needs of first aid training in comparison with online courses.

6. Conclusion

In this article, the author proposes a comprehensive, effective and efficient campus first aid learning module. The author analyses three user groups—freshmen, lab researchers, and first aid responders. The author summarized the required content and design specifications for this learning module. Aimed at the target groups and their needs, the author respectively designs three core modules: Emergency Assessment Framework, Common Campus Injuries, and Advanced Life Support. The design process reflects the author’s emphasis on Schrock's Affordances Theory. Compared with traditional methods and online courses, the module designed in this paper has unique advantages in first aid training for college students.

The module designed in this paper has good scalability. Specifically, the author can tailor content to regional safety demands. This includes accounting for environmental conditions. A campus in the Pacific Northwest might add avalanche-response modules. A Florida school would foreground hurricane-evacuation drills. This flexible design ensures the system remains applicable worldwide.

The author hopes that in the future, the module designed in this paper could be truly implemented and widely used. And the author also hopes that casualties caused by campus accidents can be further controlled, so as to create a safer campus environment for everyone.

DOI: 10.54254/2753-7048/2026.HT31566

References

[1] Gabriele, R. (2025, September 19). 2025 College Campus Crime Statistics. https: //www.safehome.org/.
[2] de Ruijter, P. A., Biersteker, H. A., Biert, J., van Goor, H., & Tan, E. C. (2014). Retention of first aid and basic life support skills in undergraduate medical students. Medical education online, 19, 24841.
[3] Renjisha, R. (2025). The effectiveness of microlearning and spaced repetition in knowledge retention across different age groups: A comparative analysis of cognitive performance and memory consolidation. International Journal of Teacher Education Research Studies (IJTERS), 2(2).
[4] Yawn, C., Van Ravenswaay, L., Marcello, K., & Nisly, S. (2025). Cumulative Cognition: Strengthening Learning with Progressive Content Delivery. Journal of CME, 14(1), 2532247.
[5] Simmons, H. E., Matos, B., & Simpson, S. A. (2017). Analysis of injury data to improve safety and training. Journal of Chemical Health and Safety, 24(1), 21-28.
[6] American Heart Association (AHA). (2025, November 8). Reclaim your rhythm CPR. American Heart Association (AHA). https: //cpr.heart.org/en/training-programs/community-programs/reclaim-your-rhythm-cpr
[7] Moore, R. L., Hwang, W., & Moses, J. D. (2024). A systematic review of mobile-based microlearning in adult learner contexts. Educational Technology & Society, 27(1), 137–146.
[8] Schrock, A. R. (2015). Communicative Affordances of Mobile Media: Portability, Availability, Locatability, and Multimediality. International Journal of Communication, 9, 18.
[9] Hu, L., & Liu, D. (2025). A Cognitive Load Theory-Based Approach to Integrating Mobile Fragmented Learning Resources. International Journal of Interactive Mobile Technologies (iJIM), 19(16), pp. 60–76.
[10] Yang, C.-W., Yen, Z.-S., McGowan, J. E., Chen, H. C., Chiang, W.-C., Mancini, M. E., Soar, J., Lai, M.-S., & Ma, M. H.-M. (2012). A systematic review of retention of adult advanced life support knowledge and skills in healthcare providers. Resuscitation, 83(9), 1055–1060.
[11] Yaylaci, S., Serinken, M., Eken, C., Karcioglu, O., Yilmaz, A., Elicabuk, H., & Dal, O. (2014). Are YouTube videos accurate and reliable on basic life support and cardiopulmonary resuscitation?. Emergency medicine Australasia : EMA, 26(5), 474