Hungarian Law Enforcement 2025/Special Issue 223–237.
DOI: 10.32577/MR.2025.KSZ.1.15
LAW ENFORCEMENT EDUCATION AND RESEARCH

Innovative Tools and Methods for Education and Research on Modern Terrorism Studies

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The complex phenomenon of modern terrorism is constantly evolving, posing challenges not only to counterterrorism units and first response forces, but also researchers in the field and teachers of terrorism studies and counterterrorism.

This paper will review the historical development of modern terrorism, global and regional trends, and the strategies and tactics of terrorist groups and individuals, counterterrorism strategies and responses to those changes. After a review of theoretical and historical background, we will focus on the challenges and opportunities in teaching theoretical knowledge about terrorism and counterterrorism methods. The presentation of the subject in higher education may differ in many respects from classical teaching methods and tools, and therefore case studies and best practices from home and abroad will be presented. Methods that promote interactive, experiential, cooperative and collaborative learning will be presented. The theoretical basis for this is the pedagogical school of problem-based learning and teaching.

In addition to education, there is a clear need to provide an overview on the research of terrorism and its methodological issues and possibilities on that field, for example regarding innovative research tools, including big data analysis, network analysis and artificial intelligence, which allow for better understanding and potentially even the forecasting of terrorist activities.

The aim of the study is to provide a comprehensive overview of the current state of terrorism in modern times and to present innovative approaches that can contribute to a better understanding of the phenomenon of terrorism.

Keywords: terrorism, history of terrorism, problem-based education, innovative research tools

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Introduction

The complex phenomenon of modern terrorism is constantly evolving and has many facets. These changes are challenging counterterrorism and first responder units all around the globe, as well as researchers and, last but not least, the educators and trainers of terrorism studies and counterterrorism in higher education.

This paper will review the historical development of modern terrorism to show the birth of modern counterterrorism pillars and reflect the needs that must be addressed in education. After that bird's-eye view, we will focus on the challenges and opportunities in teaching theoretical knowledge about terrorism and counterterrorism methods.

In recent decades, the methods and tools of higher education have evolved considerably, with the emergence of modern tools and methods. Methods that promote interactive, experiential, cooperative and collaborative learning will be presented. The Covid–19 pandemic had a significant impact on higher education. After the era of online education and exams, the development of large language models (LLM) and various forms of artificial intelligence (AI) represent new challenges and opportunities. How is university education evolving in response to these trends?

After reviewing the situation, challenges and opportunities for higher education, we need to consider how the presentation of terrorism studies in higher education differs from other fields. The first step is to show that there is a place for terrorism-related studies and materials in higher education. Of course, there is. The 20th and 21st centuries have seen significant changes in the dynamics of global terrorism and radicalisation, with increasingly sophisticated methods being adopted by terrorist groups and lone actors. These changes have posed new challenges for counterterror agencies, the intelligence community and regular police units worldwide. As such, the education and training of future professionals and experts in counterterrorism have become crucial not only for national security but also for international peace and stability.

We will show its connection to other disciplines and scientific areas. Along these lines, we need to examine whether terrorism studies should be bound, connected and presented alongside other areas or taught independently. Lastly, we need to consider whether traditional tools and methods are still effective or if we need something different. One of the fundamental questions is: in teaching a topic that reflects one of the most serious security challenges of modern times, can we incorporate new methods, or should we stick to traditional, frontal teaching methods? If so, how can we use, for example, the achievements of constructivist, behaviourist, or even humanist schools of pedagogy in terrorism studies education?

Counterterrorism education serves the dual purpose of equipping students with theoretical knowledge of the causes, methods and impacts of terrorism, while also providing analytical skills. How much of the curriculum should be dedicated to practical knowledge in higher education programs? Where is the balance between theory and practice? Furthermore, what should be the depth and nature of this practical knowledge? The aim of these studies is to provide a comprehensive overview of the current state of terrorism and to present innovative approaches that can contribute to a better understanding of the

phenomenon of terrorism. So, where is the line between academic training and university education?

The concept of competence will help us answer this question. Competence is often defined as an individual's ability to appropriately apply their knowledge, skills and attitudes to solve various situations. Ehlers (2013) describes competence as "the combination of knowledge, skills, attitudes, and other personal attributes that enable an individual to effectively solve specific problems or tasks". Mulder (2017:8) further refines the concept of competence in education and the workplace by stating that competencies are complex abilities that encompass both theoretical knowledge and practical application, together forming the basis for successful activities. Competency-based higher education has become dominant in recent years, but what are the most important competencies in the education of terrorism and counterterrorism studies?

The rise of digital platforms, the use of artificial intelligence (AI), and the increased reliance on data analytics have transformed the ways in which terrorism is countered and predicted. These technological advancements have also impacted the methodologies used in terrorism and counterterrorism education, as students are now trained to use tools for data analysis, intelligence, or knowledge related to cyberspace. The use of real-time data, interactive simulations and virtual reality in educational programs has greatly enhanced the ability of students to experience and respond to crisis situations in controlled environments. As Selwyn (2016) points out, digital tools used in higher education, such as e-learning platforms, data visualisation tools and digital libraries, allow learners to access learning materials faster, engage in more interactive learning experiences and personalise their learning. At the same time, he points out that these tools present new challenges for higher education institutions and educators. Overall, it is worth analysing in detail the use of digital and modern tools.

In addition to education, there is a clear need to provide an overview of terrorism research and its methodological issues and possibilities, for example, innovative research tools, including big data analysis, data visualisation, network analysis and artificial intelligence, which allow for better understanding and possibly even forecasting of terrorist activities.

In summary, this paper explores the methodologies used in teaching counterterrorism, focusing on the integration of technology, the balance between theoretical and practical knowledge, and the use of different teaching methods to prepare students to become experts. In addition, the paper will examine the current challenges faced by teachers in terrorism studies and discuss the future direction of terrorism and counterterrorism education.

The evolution of modern terrorism and its impact on scientific research and education

The phenomenon of terrorism has evolved dramatically in the modern era, shaping not only the global security landscape but also the ways in which terrorism is studied and taught in academic institutions.

There is no uniformly accepted approach to the origins of modern-day terrorism. David C. Rapoport's four-wave model is one of the best-known analytical frameworks for the development of modern terrorism, distinguishing four distinct periods based on the main characteristics and goals of terrorist movements. Rapoport discusses these waves in his work, *The Four Waves of Modern Terrorism,*[2] each of which is associated with different ideologies, goals and tactics.

The first wave, known as the *Anarchist Wave,* emerged in the late 19th century, primarily in Europe and Russia. Anarchist groups used terrorism as a tool to challenge state power, with the primary goal of overthrowing governments. Political assassinations were a hallmark of this wave, including the killings of Tsar Alexander II of Russia and U.S. President William McKinley.

The second wave was driven by *anti-colonial movements,* which sought to end foreign rule and gain independence for colonised nations. This wave emerged in the aftermath of World War I and gained momentum after World War II. Groups like the Irish Republican Army (IRA), the Basque Euskadi ta Askatasuna (ETA), the Algerian National Liberation Front (FLN) and the Palestinian Liberation Organization (PLO) used guerrilla tactics and terrorism to pressure colonial powers into granting independence. Kidnappings, bombings and attacks on colonial forces were common methods used during this period.

The third wave, also known as the *New Left Wave,* was closely tied to the political and ideological movements of the 1960s and 1970s, including Marxism, anti-imperialism and opposition to the Vietnam War. Terrorist groups such as the Red Army Faction (RAF) in Germany, the Red Brigades in Italy and Palestinian factions like Black September engaged in high-profile hijackings, bombings and kidnappings. This wave introduced transnational terrorism, where attacks were often carried out across borders to draw attention to political causes.

The *fourth wave* is defined by religiously motivated terrorism. Groups such as al-Qaeda and ISIS represent the most prominent examples of this wave, using terrorism as part of a global religious struggle. The *Religious Wave* is characterised by suicide bombings, the targeting of civilians and the extensive use of modern technology, including social media, to recruit and spread propaganda.

Although Rapoport's wave model is one of the most well-known and widely applied theories, the historical development of terrorism has already surpassed it in some respects, and Rapoport himself discusses the questions surrounding the *fifth wave.* Additionally, Rapoport's approach, based on the American perspective of terrorism, categorises its main trends, but the waves do not necessarily occur at the same time, with the same intensity, or with identical elements in every region. However, these deficiencies do not mean that we should discard Rapoport's wave theory; rather, we need to adapt it in relation to the historical events of the region we wish to examine. In other words, the breaking points, turning points, or the "curls" of the waves will be different if we focus on Europe, the Middle East, or Southeast Asia. The beauty of applying a historical approach lies precisely in this diverse layering.

[2] Rapoport 2004.

It is important to point out that – in my opinion – the equipment of terror used by the state, as well as state terrorism and even the state financed terrorism are a completely different phenomenon, and therefore not the focus of this paper.

Almost all researchers agree that change is permanent in the history of modern terrorism. For example, in his article *Postmodern Terrorism,* Laqueur examines the changing nature of terrorism in the modern and postmodern eras. The author concludes that the motivations, strategies and tools of terrorism have changed significantly over time. The nature of terrorist acts has also shifted: rather than targeted attacks, there is an increasing emphasis on indiscriminate killing.[3]

Changes in research of modern terrorism

Rapoport and other authors have opened up new perspectives on the study of terrorism by providing a clear historical framework for analysing the evolution of terrorist ideologies and tactics. This model emphasises that terrorism is not a static phenomenon but one that evolves in response to global political, social and technological changes. Each wave has introduced new challenges for counterterrorism efforts and necessitated shifts. It is a top priority for modern researchers to understand the ideological motivations behind terrorism and the changing nature of terrorist tactics.

In the past, terrorism studies were largely confined to political science and history, focusing on the ideological and strategic motivations of terrorist groups. However, as terrorism has become more complex and technologically advanced, new interdisciplinary research approaches have emerged. These approaches draw from political science, sociology, law and technology studies to better understand contemporary threats.

One major area of development is the use of data analytics and data visualisation in terrorism research.[4] Another significant trend is the application of network analysis to understand the structure and dynamics of terrorist organisations. By mapping the relationships between individuals, cells and larger networks, researchers can gain insights into how terrorist groups operate, communicate and transfer resources.[5] We could also mention the rise of cyberterrorism, which has also led to the development of new research methodologies focused on cybersecurity and the protection of critical infrastructure.[6]

Changes in the education of modern terrorism

Terrorism studies in higher education has undergone significant transformations from the 20th century to the 21st century, driven by the changing nature of terrorism itself. Traditional courses on terrorism often focused on the history, ideology and political

[3] Laqueur 1996.
[4] Brynielsson et al. 2012.
[5] Pedahzur 2012; Barabási 2013.
[6] Chen et al. 2014.

motivations of terrorist groups. Initially, the study of terrorism was a niche area within political science and security studies.

In the mid-20th century, the study of terrorism was primarily confined to courses in political science and international relations, focusing on state violence, insurgency movements and revolutionary activities. The Cold War era, with its proxy wars and anti-colonial struggles, was marked by a growing interest in the political motivations behind terrorism. Scholars in this period analysed how political ideologies, such as Marxism and nationalism, drove movements and terror organisations. During this time, the education on terrorism was largely theoretical, examining the historical causes of terrorism and the geopolitical struggles that shaped the global landscape. Institutions like the RAND Corporation, which had ties to military and intelligence agencies, were among the first to study terrorist tactics and counterinsurgency strategies in a systematic way.[7]

One major shift in the study of terrorism is the increasing emphasis on *experiential learning* (ELT) and *problem-based learning* (PBL). Simulations, war games exercises and case studies have become integral components of counterterrorism programs, allowing students to engage with real-world scenarios in a controlled environment. These methods help students develop critical thinking, decision-making and crisis management skills, which are essential for professionals in the field of counterterrorism.[8]

Experiential learning, based on David Kolb's 1984 model, is a method where students learn by doing. Kolb's theory emphasises four key stages: 1. Concrete experience (learning by doing); 2. Reflective observation (thinking about the experience); 3. Abstract conceptualisation (drawing conclusions from the experience); and 4. Active experimentation (applying what was learned). This cycle encourages students to engage with real-world scenarios, allowing them to deepen their understanding through direct experience. The benefits of experiential learning include greater engagement, improved teamwork and practical knowledge application. Activities such as field trips, experiments and role-playing allow students to apply lessons immediately, making learning more relevant and effective.[9] This approach helps students retain knowledge better by encouraging active participation and reflection. The problem-based learning engages students in fascinating, real and relevant intellectual inquiry, allowing them to learn from certain life situations. Through the problem-based learning (PBL) method, students acquire new skills and new methods.[10] Williams and colleagues found that students appreciate active participation in the PBL learning process. This enhances their personal development and increases their self-confidence and learning responsibility.[11] Furthermore, the integration of technology into terrorism studies and education on counterterrorism has transformed the learning process. For example, interactive data visualisation tools allow students to analyse complex information, such as terrorist network structures or the movement of extremist cells.[12]

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7 Hoffman 2006: 23.
8 Pedahzur 2012.
9 Kolb 1984.
10 Barell 2006; Harland 2002.
11 Williams et al. 2003.
12 Rémai–Hegedűs 2024.

Following the events of 9/11, terrorism studies became multidisciplinary integrating insights from a range of academic disciplines, including sociology, psychology, law, technology and counterterrorism strategies.[13] The attacks highlighted the global reach of terrorism, particularly the rise of transnational groups like al-Qaeda, and demonstrated the need for a more sophisticated understanding of decentralised, non-state actors. Universities and think tanks worldwide quickly responded by expanding their terrorism studies programs. The focus of education shifted from state-based, revolutionary terrorism to the study of terrorist network and later the lone actor's radicalisation process.[14]

Overall, by the early 21st century the education on terrorism had become highly interdisciplinary and reflected the growing complexity of modern terrorism, where understanding social dynamics,[15] psychological processes of radicalisation,[16] legal frameworks for counterterrorism[17] and technology[18] were just as important as military strategy.

One of the ongoing challenges in the education on terrorism is the rise of lone actors and the use of the online world and social media for radicalisation. These developments require universities to focus not only on traditional terrorist networks but also on the individual-level drivers of terrorism.[19] It is difficult to determine what the future of terrorism studies should focus on, but it is perhaps not an exaggeration to say that it should not focus solely on specifics. Instead, it should adopt an interdisciplinary and holistic approach that helps to better understand the complex phenomenon of terrorism.

In summary, terrorism research and education have undergone substantial transformations to adapt to the evolving nature of terrorist threats. What began as a niche field rooted in political science has grown into an interdisciplinary area of study, incorporating insights from sociology, psychology, law and technology. The integration of *experiential learning* and *problem-based learning* has allowed students to engage with real-world scenarios, fostering critical thinking and decision-making skills essential for counterterrorism professionals. As terrorism continues to shift, education must remain flexible, emphasising an interdisciplinary, holistic approach.

International methods and trends

When reviewing the international environment of terrorism studies and education on counterterrorism, we can generally observe that in larger countries, especially those highly exposed to the threat of terrorism, knowledge related to terrorism studies and counterterrorism is supported by dedicated educational programs. In the United Kingdom alone, we found 47 state-sponsored and an additional seven civilian specialised training courses, as well as undergraduate or master's programs, that either focus on terrorism itself or closely

[13] Moghaddam 2005.
[14] Laqueur 2003.
[15] Sageman 2004.
[16] Moghaddam 2005.
[17] Chen et al. 2014.
[18] Chen et al. 2014.
[19] Brynielsson et al. 2012.

related security challenges. In a 2022 internal survey, in addition to the mentioned U.K. courses, training programs from 33 other countries were reviewed, ranging from Wellington, Ottawa, Oslo, Riyadh and Abu Dhabi to Beijing. Generally, it can be said that the courses are highly diverse in terms of both the training formats and the number of hours and courses.

Typically, these programs adopt a holistic security approach: the courses aim to provide a comprehensive view of the challenges, risks and threats posed by terrorism, from societal perspectives to various subsystems, and in many cases, they place special focus on addressing threats affecting the private sector. The programs generally follow a modern, modular and flexible format, where counterterrorism issues are embedded within a broader field, such as security studies. In many publicly available curricula, new types of challenges appear, such as the role of healthcare, eco-terrorism, the issue of drones, cyberterrorism, new forms of attack (e.g. ramming – terror attacks carried out with vehicles), expected changes in radicalisation, and measures to defend against and combat these threats. Additionally, border areas such as data security or the ethics of counterterrorism are also addressed.[20]

Key competencies in higher education of terrorism studies

The shift in higher education from traditional lecture-based instruction to more dynamic, student-centred learning environments has led to a new focus on the competencies that institutions seek to cultivate in students. Competencies are broadly defined as the combination of knowledge, skills, attitudes and values that enable individuals to perform tasks and solve problems effectively (EU Science Hub). Competencies in higher education typically encompass a broad range of abilities, from cognitive skills such as critical thinking and problem-solving to interpersonal skills like communication and teamwork. According to Ehlers (2013), a competency is not simply about acquiring knowledge but about being able to apply that knowledge in real-world situations.

In response to the demands of the 21st century job market and societal changes, higher education institutions have identified several key competencies that are essential for student success. These competencies are recognised by global frameworks, such as the European Qualifications Framework (EQF), which aim to standardise educational outcomes across different countries. In our case, we are referring to EQF6 (bachelor), EQF7 (master), EQF8 (PhD) levels which distinguish the following three dimensions:

The European Qualifications Framework (EQF) is designed to harmonise and standardise qualifications across European Union countries, facilitating the recognition of qualifications. It defines eight levels that describe the knowledge, skills and competencies individuals are expected to achieve at each stage of education and training. In the context of higher education, levels 6 (bachelor's), 7 (master's) and 8 (doctoral) are most relevant. For example, in *knowledge* category at level EQF7 "the focus is on advanced knowledge of the latest developments in a subject area, often extending into interdisciplinary fields".

[20] Dobák–Rémai 2025.

In relation to *skills* at level EQF7, the students "should develop innovative solutions, manage complex situations, and apply new techniques in practice while critically analyzing existing theories". They also have competence at level 7 to "manage complex technical or professional tasks, take responsibility for decision-making, and oversee processes within an organization". The EQF integrates knowledge, skills and competencies to define what individuals should know and be able to do at each qualification level, particularly in higher education.

To provide the knowledge, skills and competences needed at each level, a number of elements are essential. For example, *critical thinking*[21] and *problem-solving*[22] are considered two of the most important competencies in modern education. Furthermore, as digital technologies become integral to nearly every profession, digital literacy has emerged as a key competency in higher education. Effective *communication* is a fundamental competency that transcends all fields of study. In higher education, communication skills encompass the ability to convey ideas clearly and persuasively, both in writing and orally. This includes academic writing, public speaking, and the ability to engage in productive discussions and debates. Collaboration, or the ability to work effectively with others, is equally important.[23]

Digital literacy refers to the ability to use information and communication technologies (ICT) effectively to access, analyse and communicate information. The Covid–19 pandemic has underscored the importance of digital literacy, as many educational institutions shifted to online learning platforms. Additionally, the use of artificial intelligence (AI) and *machine learning* is becoming more prominent in global counterterrorism strategies. AI tools are being developed to analyse vast datasets, detect patterns in terrorist communications and predict potential attacks before they occur.[24] It is important to understand that the students need to keep learning throughout their careers, because knowledge changes and expands rapidly, therefore they need the competence of *adaptability and lifelong learning (LLL).*

Competency-based education (CBE) is an educational model that focuses on the development and assessment of competencies rather than the completion of specific courses or the accumulation of credit hours. This model is particularly well-suited to adult learners and working professionals, as it allows for flexible, personalised learning paths.[25] In modern higher education, the focus on competencies represents a shift from traditional content-driven models of education to outcomes-based approaches that emphasise the practical application of knowledge. Critical thinking, digital literacy, communication, ethical reasoning and adaptability are among the core competencies that students must acquire to succeed in today's rapidly changing world. By aligning curricula with these competencies, higher education institutions can better prepare students for the everyday challenges and opportunities. This is also true of the educational fields of terrorism studies.

[21] Paul–Elder 2019.
[22] Mulder 2017.
[23] Mulder 2017.
[24] Coaffee 2013.
[25] Ehlers 2013.

Some education methods as best practices in higher education of terrorism studies and counterterrorism

In our country, we have been talking about counterterrorism knowledge in higher-education since the mid-2010s, while abroad, especially in the countries of the West, there is a more serious tradition of this, which is essentially linked to the 9/11 attacks.

Theoretical frameworks in counterterrorism education

A theoretical understanding of terrorism is a foundational aspect of the education on counterterrorism. Scholars like Bruce Hoffman and Martha Crenshaw have developed widely recognised definitions and frameworks for studying terrorism. Hoffman (2006) emphasises the role of political violence, while Crenshaw (2011) focuses on the psychological and organisational aspects of terrorist groups. Theoretical models provide a psychological basis for understanding the process of radicalisation, which is essential for identifying terrorist activities. Modern education on counterterrorism integrates various academic disciplines to provide a comprehensive understanding of terrorism.

It is important to have external expert lecturers alongside the permanent teachers, as well as a method of working through professional case studies that can help to deepen the practical experience. One of the reasons for this is that terrorism studies require non-traditional teaching methods. Because of the special nature of the field, it is important that, in addition to the quasi-academic teaching of basic knowledge and new findings, there are lectures by experts who are active in the field and can raise the level of students' knowledge by providing relevant examples. Guest lecturers can provide specific expertise and information, helping significantly to maintain the uniqueness of the course, but this form of teaching makes it much more difficult to use the traditional university bibliography and note-taking apparatus, with students having to rely much more on class materials and their own notes. For example, an educational method is used to demonstrate the role of civil research centres in counterterrorism and to illustrate the usefulness of cooperation between professional bodies and social organisations through international examples. We have also incorporated an independent practice exercise, where students work in groups to map out the network of international research centres and identify the validated and reliable information they could collect on a given topic.

PBL and case studies

In addition to theoretical learning, practical experience plays a crucial role in the education on counterterrorism. C*ase studies* and *problem-based learning* (PBL) methods have proven highly effective. Case studies provide real-world examples that students can analyse to develop a deeper understanding of counterterrorism tactics.[26]

The literature on the education on counterterrorism emphasises the importance of a multidisciplinary approach that incorporates both theoretical knowledge and practical

[26] Pedahzur 2012; Spalek 2012.

skills. As terrorism continues to evolve, educators must adapt their methods to ensure that students are prepared to face both conventional and emerging threats. By integrating case studies, technological tools and innovative teaching methods, higher education institutions can provide students with the comprehensive training necessary to excel in the complex field of counterterrorism.

Problem-based learning allows students to engage with realistic scenarios, encouraging critical thinking and teamwork. Williams and colleagues (2003) found that students appreciate active participation in the learning process, which fosters personal development, confidence and accountability. Based on that theory, the Ludovika University of Public Service (LUPS), Faculty of Law Enforcement, Department of Counterterrorism with the support of the LUPS Proof of Concept project has developed a simulation platform that allows students to practice problem-solving in both individual and group formats. These simulations mimic real-world crises, enabling students to apply classroom knowledge to practical situations, thereby bridging the gap between theory and practice.[27] The aim of the development was to create a platform envisioned by the Department of Counterterrorism, enabling the creation of simulations that facilitate problem-based task-solving in both individual and group formats. The framework is centred around the simulation space, where "players" engage in solving pre-constructed scenarios and follow paths built on pre-programmed logical decisions based on their choices. In addition to tasks reminiscent of "wizard books", a knowledge area and a quiz area, designed to prepare for exams, also assist in the transfer of knowledge. The spaces within the application jointly develop creative learning, education and problem-solving. The application can be used within university settings, focusing on security dimensions, but it can also be suitable for outlining and practicing simulations in primary schools, high schools and specialised training environments. It is capable of transmitting not only skills but also knowledge and ways of thinking. Within the pilot project, the framework has been programmed. The expansion of the application and further development opportunities depend on the capacity and willingness of the aforementioned educational spaces, as well as on the openness of similar institutions towards new, innovative education.[28] The application is currently in the implementation phase, but we hope that in the coming years it will become one of the flagship tools in our educational resources, which we can use in many of our courses and share with a wide audience for broader application.

Data-driven education

The integration of *data visualisation* tools is particularly important in analysing complex information. These tools help students map terrorist networks, simulate crisis scenarios and enhance decision-making skills.

In almost every profession *data-driven decision-making* is becoming an integral part of everyday work, where the rapid and accurate analysis of data is crucial. One prerequisite for this is that students – regardless of their field of study in higher education – must

[27] NKE PPI 2019.
[28] Project 3S 2023.

acquire the related mindset, learn to use data-driven tools and interpret the results. This also presents challenges for educators, as they must lead by example, represent high quality in the content and visual presentation of their teaching materials and lectures, while also sparking students' interest in data, data visualisation and data-driven approaches. The ability to analyse data quickly and accurately is crucial in modern security operations. Data visualisation – one of the key methods for making complex data, datasets and databases more understandable and communicating them more effectively – can play an especially important role in enhancing students' skills and increasing the amount of knowledge acquired in any training program.[29]

Data visualisation tools, such as heat maps and real-time incident tracking, enable students to engage with complex datasets more effectively and improve their critical thinking skills.[30] The use of interactive data visualisation tools significantly enhances the students' ability to process and analyse complex information. These tools help to foster critical thinking and problem-solving skills. For instance, the use of heat maps and real-time incident tracking software allows students to simulate crisis management situations, thereby improving decision-making under pressure.

The use of technology has also transformed the learning process by facilitating *blended learning environments,* which combine traditional classroom instruction with digital platforms, allowing for flexibility and up-to-date curricula. This approach allows for flexibility in teaching and learning, providing students with the opportunity to engage with material asynchronously while still participating in live discussions and simulations. These hybrid models of learning are especially effective in counterterrorism education, where constant updates to the curriculum are necessary to reflect the latest developments in security threats. Software (e.g. Miro Board) and technical tools (e.g. interactive whiteboards) that support collaborative learning processes will be introduced on an experimental basis in the near future.[31]

Scenario based learning

Terrorism and counterterrorism education must not only provide theoretical knowledge but also emphasise practical skills development. There is a huge importance of practice-oriented learning in security education, noting that interactive simulations and real-time analysis help bridge the gap between classroom theory and field application. This methodology enables students to apply their knowledge in controlled environments that mimic real-world scenarios. For example, scenario-based simulations allow students to work through response strategies and improve their situational awareness and work in pairs or group to develop their communications skills and collaborative competences.

[29] Rémai–Hegedűs 2024.
[30] Rémai 2024.
[31] Pásztor-Kovács 2015.

Future challenges in the education of terrorism studies

As the landscape of global terrorism continues to evolve, the education of terrorism studies must keep pace with emerging technologies and the complex nature of contemporary threats. The future of the education of terrorism studies faces several key challenges, driven primarily by technological advancements, ethical considerations and the need for interdisciplinary approaches.

One of the most profound changes impacting education of this field is the rise of *artificial intelligence* (AI) and *machine learning* (ML). AI's ability to process vast amounts of data in real-time offers unprecedented opportunities for education, but it also brings new challenges. The integration of AI in terrorism studies is inevitable. Rather than avoiding its use, educators must embrace AI as a learning tool while teaching students the importance of mastering critical skills.

Another significant challenge is finding the balance between specialised knowledge and a broad understanding of global security threats. The interdisciplinary nature of terrorism studies means that students must also have a comprehensive understanding of political, social and economic contexts. As terrorism becomes more sophisticated, driven by both physical and digital threats, educators must ensure that students are prepared to tackle issues in diverse environments.

The rise of AI and digital intelligence tools raises numerous *ethical concerns*. Teachers face the difficult task of incorporating discussions around privacy, human rights and the legality of pre-emptive actions, such as drone strikes and data collection.[32]

The rapid evolution of terrorism necessitates constant updates to educational curricula. Institutions must innovate by integrating real-time data analysis, dynamic learning platforms and global cooperation to ensure that students are prepared for the multifaceted nature of modern terrorism.

In conclusion, the future of the education of terrorism and counterterrorism studies will be shaped by the ability to integrate *cutting-edge technologies* such as AI and machine learning into the curriculum while maintaining a strong ethical foundation. Educators must strike a delicate balance between specialisation and broader knowledge, ensuring that students are equipped to navigate the rapidly changing world of global terrorism.

Conclusion

The future of the education of terrorism studies will be shaped by its ability to adapt to the rapidly changing landscape of terrorism and the advancements in technology. As we have seen throughout this discussion, the shift from traditional theory-based education to a multidisciplinary and technology-driven approach is crucial. The integration of tools such as artificial intelligence, machine learning, data visualisation and simulations has enhanced both the learning process and practical skill development, enabling students to engage with real-world scenarios and complex security issues.

[32] Coaffee 2013.

However, challenges remain. One of the primary issues is balancing specialised knowledge with a broader understanding of the global security landscape. While students need to become experts in particular areas, they must also understand the broader political, social and economic contexts in which terrorism evolves. Additionally ethical concerns will continue to be an essential component of educational curricula, ensuring that students are equipped to make informed, ethical decisions in their professional roles.

The ongoing development of problem-based learning (PBL), experiential learning (ELT) and the use of case studies in educational programs will remain critical in bridging the gap between theory and practice. These methods help students develop critical thinking, decision-making and crisis management skills, communications and cooperation skills which are vital. Because of the development of the digital technology, institutions must stay ahead of the curve by regularly updating their educational approaches. In conclusion, the future of the education of terrorism studies will rely heavily on its adaptability to new threats and its integration of cutting-edge technologies.

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