

Villa College

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VC Research Digest provides updates on current and ongoing research projects of Villa College staff and students, and provides fresh research ideas and snippets to help expand the horizon of research and inquiry

EDITORIAL

Texts as Evidence: How Document Analysis Can Help Uncover Buried Stories

Dr Ahmed Shahid, Editor

Document analysis is a useful research method that entails the collection and interpretation of relevant documents as part of the research design. A wide variety of documents can be used in document analysis, which are interpreted collectively to identify relevant patterns and meanings. Document analysis is a type of content analysis which is also sometimes referred to as textual analysis.

As a general practice, document analysis can include public records, personal documents and other forms of documents, artefacts or evidences. Documents can include books, newspapers, magazines, periodicals, websites, blogs or other forms of archived documents. For example, newspaper articles within a given period of time, periodicals such as “Faithoora” or “Dheenuge magu”, or a particular genre of websites and blogs can be used as documents. While not strictly documents, comments or opinions in websites, and social media interactions are also used in textual analysis by researchers. Depending on your selection of documents or text, you may need to consider their credibility, dependability, conformability, transferability and authenticity as part of validating the data. These sources can be analysed using a pre-determined rubric or framework which is built on the research aims and objectives.

It is important to remember that document analysis is a methodological approach in its own right and is different from the regular literature review. A researcher using document analysis as the main methodological approach can utilise documents as the main source of data, which is reviewed, analysed and triangulated in order to develop findings and conclusions. If you are using document analysis method, it is essential to identify the total population of typical documents that you target and then develop the sampling approach to select a set of documents for analysis. The analysis framework can be based on

linguistic structure, main topics or themes, developmental patterns, etc., which reflect the nature and purpose of your research project.

Research scholars suggest two broad approaches to work with texts – treating the document as a ‘respondent’ and asking questions to get the answers from each document, or to treat text as data and develop an understanding of the text through quantifying the occurrence of certain ideas or concepts. The approach of document/ textual analysis – which is also sometimes referred to as thematic analysis – can be used to develop a deeper understanding of a social phenomenon as it is understood and documented in its broad context.

Using document analysis as a research method has its advantages. In particular, if there is a rich source of documented data in a particular field which covers a significant period of time, such data can give better insights into the phenomenon as compared to limited primary data. Additionally, this type of data is also referred to as ‘non-reactive’, meaning that they are not influenced by the researcher and can be subjected to repeated analysis. Documents can also contain very rich past data that no longer can be observed, provide details that informants have forgotten, and can track changes and developments over a period of time. While there are obvious advantages in using documents as a source of data, it is also important to remember that documented data may not always ‘fit’ the purpose of the researcher and can sometimes be incomplete or unreliable.

While document analysis is not a very popular or ‘preferred’ methodological approach among our students and researchers, this is an approach that has huge potential and value. It is undoubtedly a method that can be applied in many research projects which will help enrich our research landscape.

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Constructing a Conceptual Framework in Qualitative Research

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Conceptual frameworks emerged from the theorising process. Often, students confuse and interchangeably use the theoretical and conceptual frameworks; however, this is not the same. A conceptual framework consists of interwoven concepts the researcher puts together to understand the phenomenon comprehensively. Therefore, concepts are the core elements identified as the investigation's interest, usually articulated in the research question. These core constructs are the driving force that steers the research and should be considered throughout the study's development process. Hence, a conceptual framework becomes the road map of the investigation and evolves as the researchers' understanding of the study deepens. It is a product of the process of qualitative theorisation.

Although theoretical and conceptual frameworks are used interchangeably (Merriam & Tisdell, 2016), there are several distinctive characteristics of a theoretical and conceptual framework. A theoretical framework is the structural model or idea of the existing theories that serve as a building block for the arguments presented. The conceptual framework illustrates how the study's elements align with knowledge of the study's topic, theory, and methodological design (Crawford, 2019). Generally, a conceptual framework is about connecting ideas—concepts, variables—that interest the study (van der Waldt, 2020).

With these differences, the theoretical framework can be considered a component of the conceptual framework that facilitates, among others, the formulation of a methodological plan for the study (Luft et al., 2022). Therefore, a conceptual framework represents how the theory, method, and researcher's knowledge of the topic are interwoven in a study. It concerns the researcher's assumptions about why theories drive the study, which qualitative approach is selected for the research design, and how knowledge is constructed. Therefore, the conceptual framework has three premises: knowledge, theory, and methods.

Working out a conceptual framework

Step 1: Identify the key concepts/variables of the study

The researcher must be familiar with the concepts being used in the study. To create a conceptual framework, deciding on the vocabulary or key ideas that will be investigated is essential. For the researcher to know what they are working with, it is crucial to define it.

Step 2: Identifying the key theoretical premises of the concepts.

Once the concepts are identified and defined, verifying them against the theoretical foundation of how these concepts have been used is helpful. Have there been any hypothetical assumptions, and what has been proven for these concepts? This is one way of looking at the theoretical premises.

Step 3: Identifying the methodological process of extracting concepts

Identifying how the concepts have been defined in the literature is important. Look for patterns and the application of these concepts. Identify the interrelationships within and across the concepts. Select a method that synchronises with the selected concepts and the research question. Exploring the qualitative approach best suited to explore the research question and the concepts at hand will allow the researcher to choose a data collection technique or techniques.

“YOU ARE YOUR CHOICES”

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Examples of a conceptual frameworks (Nasheeda, 2020; Nasheeda et al., 2015).

A study on exploring social construction experiences through life skills education program during adolescence in Maldives

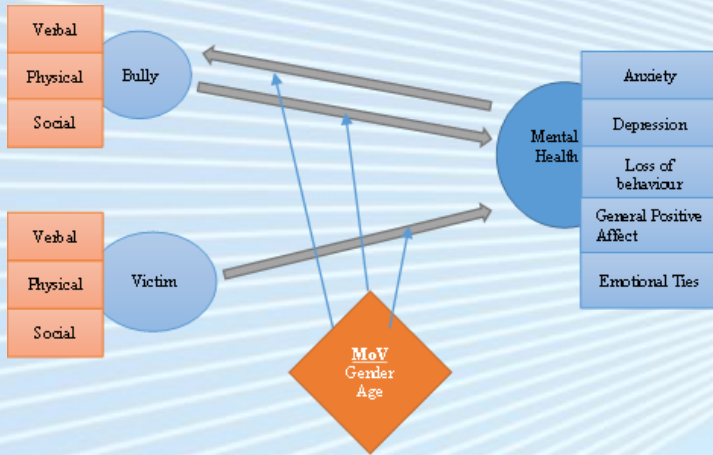


Figure 1: conceptual framework for a quantitative study

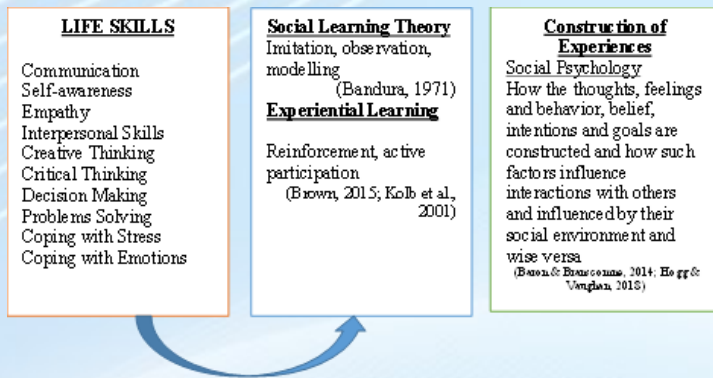


Figure 2: Conceptual framework for a qualitative study

Therefore, to develop a conceptual framework for qualitative research, the researcher needs to be aware of his or her worldviews on the study approach, investigate the theoretical foundation of the study concepts, and explore why and how the researcher will go about investigating the concepts and variables selected for the study. Creating a solid conceptual framework for qualitative research necessitates careful consideration and a rigorous approach from researchers. It entails acknowledging and comprehending their worldviews, looking at the theoretical foundations of the study's concepts, and explaining the justifications and procedures for looking into the chosen concepts and variables. Researchers can build a solid foundation for their investigation, make data collection and analysis more manageable, and ultimately advance knowledge in their fields of study by following those

essential steps.

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SAMR Model: A Guide to Transformative Tech Integration

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INTRODUCTION

In education, the pursuit of effective technology integration transcends the allure of the latest gadgets and digital marvels. It revolves around a nuanced awareness of the multifaceted array of available technological options and the discerning ability to select the most appropriate strategies for each unique instructional scenario. Tereda (2020) states good technology integration is not about using the fanciest tool. It is about being aware of the range of options and picking the right strategy or strategies for the lesson at hand. This article embarks on a comprehensive exploration of the SMAR Model, a powerful framework that serves as an illuminating guide to transformative technology integration.

According to a comprehensive study conducted by Johnson, Jacovina, Russell, and Christian in 2016, a noteworthy insight emerges: the primary challenge associated with online teaching is often not rooted in technological concerns. Instead, educators actively embrace educational technology due to its potential to yield substantial positive outcomes in student performance. This adoption is underscored by its capacity to enhance test scores and streamline the assessment of student achievement, thereby promoting greater instructional efficiency.

The advent of the COVID-19 pandemic undeniably exerted a profound catalytic effect on the integration of educational technology. Educators nationwide found themselves compelled to swiftly transition to online instruction in response to the crisis. However, as numerous educators have aptly observed, the current landscape of higher education online learning often resembles a form of crisis management—rather than a particularly planned implementation of distance education.

Amidst the urgency of the situation, the discussion surrounding the highest quality technology integration warrants careful consideration. It encompasses not only the urgent needs of the present but also the enduring strategies that will shape the future of education. As we navigate this transitional phase, we must engage in a dialogue that transcends immediate exigencies, charting a course toward a harmonious coexistence of digital and traditional educational paradigms.

THE SAMR MODEL

One of the formidable conceptual frameworks for contemplating technology integration and optimizing educational technology's efficacy is the SAMR model. This model, conceived in 2010 by the esteemed education

researcher Ruben Puentedura, has garnered recognition for its innovative approach and earned Puentedura the prestigious Phi Beta Kappa teaching award in 1991.

The SAMR Model equips educators with a multifaceted approach, emphasizing the critical importance of thoughtful selection and strategic implementation of technology tools. By empowering teachers with the knowledge and tools to make informed choices, the SAMR Model ensures that technology is an enabler, enhancing the learning experience rather than becoming an obstacle. In

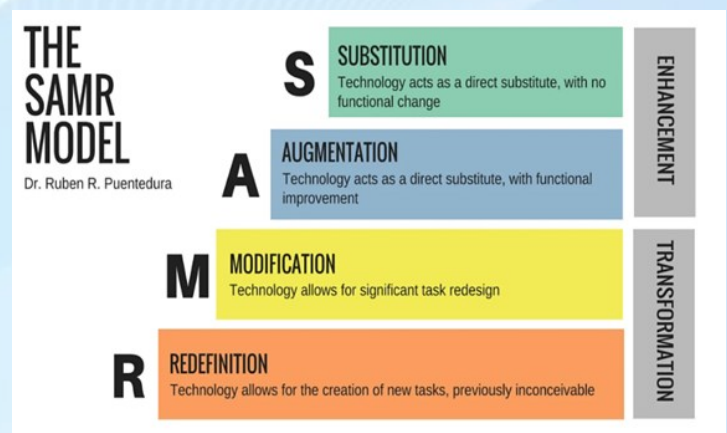


Figure 1: The SAMR Model

the following pages, the key components of the SAMR Model will be dissected to elucidate its practical applications, providing educators with a roadmap to harness the full potential of technology for educational enrichment.

The SAMR Model delineates four distinct tiers of online learning, roughly arranged in ascending order of sophistication and transformative potential: Substitution, Augmentation, Modification, and Redefinition. In the transition to an online format, educators frequently prioritize the initial two tiers, that entail substituting conventional materials with digital counterparts. This involves converting lessons and worksheets into PDFs for online distribution or recording lectures as videos to facilitate asynchronous learning.

Cultivating effective technology integration transcends the metaphorical ascent of the SAMR model's summit. It is, in essence, an endeavour grounded in a nuanced understanding of the full spectrum of technological possibilities. The art of tech integration lies in the discernment exercised to select the most apt strategy, or a combination thereof, tailored precisely to the distinctive requirements of each lesson.

To gain a profound insight into exemplary classroom practices across the SAMR model's four tiers, let us embark on a detailed exploration.

SUBSTITUTION

Categorized as the initial stage of the SAMR model, 'Substitution' involves the direct replacement of conventional teaching materials and practices with digital equivalents. Importantly, this substitution results in no substantial alteration to the core content; it merely transforms the mode of delivery (Terada, 2020).

Substitution represents a simplified implementation of educational technology, where digital tools serve as direct substitutes for traditional methods. This approach offers practical advantages, such as time and space efficiency, as it eliminates the need for laborious tasks like photocopying or handling physical resources. Instead of managing stacks of printed materials, educators can seamlessly organize digital resources with a few clicks.

Examples of Substitution include:

1. Having students type their assignments instead of writing them by hand.
2. Employing online quizzes and software in lieu of traditional pen-and-paper assessments.
3. Uploading worksheets in PDF format for easy student access, replacing the need for physical copies.

Recognizing that 'Substitution' strategies do not inherently alter the learning process, or its outcomes, is paramount. Therefore, educators should conscientiously evaluate the value added by technology before its implementation.

AUGMENTATION

A critical stage in the SAMR model, 'Augmentation' involves the integration of interactive digital enhancements, such as comments, hyperlinks, or multimedia elements, into educational materials and activities. Notably, the core content remains unaltered, but incorporating digital features enhance the learning experience (Terada, 2020).

At the Augmentation level, technology transcends mere convenience, offering substantive benefits to the learning process. It has the potential to elucidate complex topics, rendering them more comprehensible, and infuses engagement that surpasses what traditional methods can achieve. Augmentation opens avenues for fostering independent and student-centric learning. By leveraging technology as a wellspring of information, students embark on a self-directed learning journey, reducing their reliance on constant teacher-led instruction.

Examples of Augmentation include:

1. Students deliver informative and engaging oral presentations complemented by multimedia-rich slideshows using tools like PowerPoint or Prezi.
2. Encouraging students to independently research topics using internet resources, promoting self-reliance and research skills.

Essentially, 'Augmentation' represents a significant step in harnessing technology's potential to enrich the learning experience, making it more interactive, engaging, and conducive to independent student exploration.

MODIFICATION

Within the SAMR model, 'Modification' represents an advanced phase where technology extends its reach into the very design of interactive and dynamic learning experiences, transcending the confines of traditional classrooms (Terada, 2020).

At the 'Modification' level, educators leverage learning management systems such as Google Classroom, Moodle, or Canvas to manage various logistical aspects of classroom management efficiently. These platforms facilitate the tracking of grades, seamless communication with students, calendar creation, and assignment postings. Importantly, teaching in an online environment unlocks new communication channels, offering advantages to students who have historically faced marginalization. This approach fosters student collaboration, enabling them to work on shared documents or engage in large group projects. This peer-to-peer collaboration cultivates a more cooperative and vibrant classroom culture.

Examples of Modification include:

1. Students create podcasts summarizing key topics, accessible as valuable revision resources for their peers.
2. Utilizing technological tools to render abstract concepts tangible, such as embarking on virtual voyages using Google Earth to deepen understanding of measurement and geography.

Basically, 'Modification' signifies a significant transformation in the educational landscape as technology enables collaborative, innovative, and immersive learning experiences.

REDEFINITION

In the SAMR model, 'Redefinition' emerges as the pinnacle of technological integration, where the transformative potential of technology becomes fully realized (Best, 2020). At this stage, learning transcends its traditional confines, paving the way for entirely novel educational opportunities (Terada, 2020).

'Redefinition' entails a fundamental transformation of the learning process, rendering possible activities previously inconceivable in the classroom setting. This paradigm shift not only connects learning with the real world but also yields authentic outcomes. Importantly, it equips students with robust technological soft skills, including digital collaboration, effective communication, technological literacy, and adaptability to new systems and processes. It engenders an environment where students exhibit vibrant engagement and embrace a growth mindset.

Examples of Redefinition encompass:

1. Empowering students to publish their work online exposes it to a broader audience, including peers and the wider community.
2. Capturing students delivering presentations or demonstrating physical skills, and subsequently utilizing these recordings to prompt student reflection and self-improvement.
3. Exploring tasks incorporating extensive multimodal elements, such as producing documentaries, short films, webpages, or print documents with creative layouts.

Fundamentally, 'Redefinition' epitomizes the profound impact of technology on education, revolutionizing the learning experience to one that is dynamic, authentic, and firmly anchored in the real world, while simultaneously cultivating a generation of technologically adept, adaptable, and engaged learners.

CONCLUSION

In higher education, the application of the SAMR model takes on heightened significance as it **empowers educators to navigate the ever-evolving landscape of teaching and learning**. It provides a **structured framework to assess and enhance technology integration**, ensuring that its implementation transcends superficial application and resonates with the core goals of higher education.

By selecting the appropriate SAMR model stage, educators can tailor their approach to deliver content effectively but also deliver content effectively and enhance relationships within the educational environment. It is a powerful catalyst for **fostering meaningful connections between instructors and students** as it encourages educators to contemplate how technology can **fundamentally improve lessons, engage and empower students, and mirror real-world learning experiences**. It prompts faculty to approach technology integration with a purpose-driven mindset, mitigating the risk of deploying technology haphazardly.

Through thoughtful self-inquiry, educators can ascertain the precise outcomes they aim to achieve through technology, thereby elevating the quality of their students' learning experiences. This deliberation underscores why technology surpasses traditional methods and determines the readiness of both instructors and students to embrace the chosen technology.

In the higher education landscape, the SAMR model's role becomes even more pronounced as it offers a roadmap for instructors **to blend technology with pedagogy effectively**. Educators can carefully select the most appropriate SAMR stage to **enhance their teaching methods, foster deeper engagement, and create an authentic, real-world learning environment**.

Ultimately, technology in higher education transcends the mere transmission of knowledge; it signifies an unwavering commitment **to preparing students for the challenges and opportunities** of an increasingly digital world. When educators harness technology's creative potential within the

SAMR model's structured framework, they inspire academic growth and **the development of critical skills and adaptability**, nurturing a generation of learners ready to excel in the complex, interconnected global landscape of higher education.

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FROM THE WORLD OF RESEARCH

Informing the Global Data Future: Benchmarking Data Governance Frameworks

Sara Marcucci, Natalia González Alarcón, Stefaan G. Verhulst and Elena Wüllhorst

ABSTRACT

Data has become a critical trans-national and cross-border resource. Yet, the lack of a well-defined approach to using it poses challenges to harnessing its value. This article explores the increasing importance of global data governance due to the rapid growth of data, and the need for responsible data practices. The purpose of this paper is to compare approaches and identify patterns in the emergent data governance ecosystem within sectors close to the international development field, ultimately presenting key takeaways and reflections on when and why a global data governance framework may be needed. Overall, the paper provides information about the conditions when a more holistic, coordinated transnational approach to data governance may be needed to responsibly manage the global flow of data. The report does this by (a) considering conditions specified by the literature that may be conducive to global data governance, and (b) analyzing and comparing existing frameworks, specifically investigating six key elements: purpose, principles, anchoring documents, data description and lifecycle, processes, and practices. The article closes with a series of final recommendations, which include adopting a broader concept of data stewardship to reconcile data protection and promotion, focusing on responsible reuse of data to unlock socioeconomic value, harmonizing meanings to operationalize principles, incorporating global human rights frameworks to provide common North Stars, unifying key definitions of data, adopting a data lifecycle approach, incorporating participatory processes and collective agency, investing in new professions with specific roles, improving accountability through oversight and compliance mechanisms, and translating recommendations into practical tools.

Read on...<https://www.jstor.org/stable/10.2307/26727084>



SCAN ME

Visiting Scholar Program: A Model for International Collaboration

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In today's interconnected world, collaborative research transcends borders, offering many opportunities for academic institutions and researchers. As an early career researcher, fostering international networks and connections should be a top priority to propel to the forefront of global research endeavours. This article will explore the importance of building international collaborations, strategies to establish and maintain them, and the benefits they bring to the table.

International collaborations are crucial for research because they can access diverse expertise, pool resources, and address global challenges. These partnerships provide access to fresh perspectives, methodologies, and knowledge, enhancing the quality and novelty of research (Zhao & Liu, 2023; Young, 2019). They also help reduce financial burdens and enhance research capabilities (Ammigan & Caro, 2022). Furthermore, international collaborations offer a platform to tackle global issues, offering innovative solutions collectively.

INTI University Visiting Scholar Program

In the pursuit of building international networks and connections for collaborative research, institutions often look for innovative programs that facilitate cross-border academic exchange. One exemplary initiative in this regard is the [INTI International University Inbound Visiting Scholar Programme](#), which serves as a beacon of successful international collaboration.

The INTI International University Visiting Scholar Program is a structured initiative that promotes collaboration and knowledge sharing between INTI University in Malaysia and academic institutions worldwide. This program invites scholars and researchers from diverse fields to spend a defined period at INTI University, contributing to research, teaching, and cultural exchange. The Visiting Scholar Program is more accessible for Villa College Academics under the recent collaborative MoU with INTI International University, Malaysia.

Key Features of the Program

Research Engagement: Visiting scholars participating in the program actively engage in research activities that align with both their areas of expertise and the academic priorities of INTI University. This engagement encompasses various collaborative initiatives, such as joint research projects, seminars, workshops, and the potential for co-authored publications. By fostering these research collaborations, the program seeks to enhance the academic environment at the university, encouraging knowledge exchange and the advancement of scholarly contributions.

Teaching and Mentoring: The visiting scholar program also emphasizes the crucial role of visiting scholars as educators and mentors. Scholars are invited to share their wealth of knowledge and experience with students and faculty at INTI University. This involves conducting guest lectures, leading workshops, and providing valuable

mentorship to students. Through their teaching and mentorship, visiting scholars play an integral role in



cultivating a global perspective within the educational landscape of the university, contributing to the development of well-rounded and internationally aware students.

Cultural Exchange: Beyond the confines of academia, the program underscores the importance of cultural exchange.



Visiting scholars are afforded the unique opportunity to immerse themselves in Malaysian culture, creating a rich tapestry of diverse experiences. This immersion extends far beyond the confines of the university campus, enriching the broader community with the insights and perspectives these scholars bring. This enhances the global awareness of the scholars themselves and contributes to a more culturally diverse and inclusive environment at INTI University.

Networking Opportunities: Moreover, visiting scholars benefit from the extensive academic network of INTI University. Throughout their stay, they can connect with colleagues and researchers from around the globe. These networking opportunities enrich their experience during their tenure and can lead to lasting collaborations and partnerships well beyond the program's duration. The exchange of ideas and knowledge facilitated by this network not only enhances the scholarly community at INTI University but also contributes to broader advancements in research and education on a global scale.

Benefits of the INTI University Visiting Scholar Program

The INTI University Visiting Scholar Program offers many

substantial advantages, benefiting both the institution and the visiting scholars in multifaceted ways.

1. Academic Enrichment: The program catalyzes academic enrichment. By welcoming visiting scholars into its fold, INTI University injects fresh perspectives and specialized expertise into its academic milieu. This enriches the overall intellectual environment of the institution, fostering a climate of innovation and intellectual growth. Consequently, these contributions manifest in increased research output, positively impacting the institution's academic standing and enhancing the quality of education for students.

2. Cultural Exchange: A pivotal facet of the program is emphasising cultural exchange. Visiting scholars contribute to INTI University's academic landscape and benefit personally by immersing themselves in the vibrant tapestry of Malaysian culture. This immersive experience cultivates intercultural competence and global awareness among scholars, adding a profound layer of depth to their academic journey and broadening their horizons.

3. Collaborative Research: The program actively encourages collaborative research initiatives. This collaborative ethos allows scholars to engage with the university's faculty on projects of mutual interest. This synergy frequently results in co-authored publications and

the growth and evolution of the academic community at INTI University and beyond.

In conclusion, building international networks and connections for collaborative research is a strategic move that can significantly elevate an institution's research prowess. By establishing clear objectives, leveraging existing contacts, and nurturing collaborations, we can unlock a world of opportunities for innovative research, global recognition, and impactful solutions to the challenges of our time.

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advancements across various academic domains. Thus, The program becomes a hub of intellectual cooperation, driving the boundaries of knowledge and innovation.

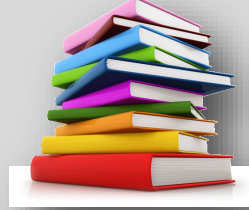
4. Global Engagement: Participation in the program augments INTI University's global footprint. The international connections forged through this program expand the university's network, transforming it into a hub for global engagement. Consequently, the institution is ideally positioned to foster international collaboration, fostering a truly global perspective in its academic pursuits.

5. Long-Term Partnerships: The relationships cultivated through the program extend far beyond the scholar's temporary visit. These connections frequently evolve into enduring partnerships, providing sustained research opportunities and academic exchange opportunities. These long-term affiliations are invaluable, as they facilitate the continuous flow of knowledge and ideas, contributing to

✦ ✦
THERE IS NOTHING
MORE DIVINE THAN
EDUCATION. IT IS
ONLY THROUGH
EDUCATION THAT ONE
TRULY BECOMES MAN



P l a t o



Effects of a daily physical activity intervention on the health-related fitness status of primary school children: A cluster randomized controlled trial

Gerald Jarnig, Reinhold Kerbl, Johannes Jaunig, Mireille N.M. van Poppel

ABSTRACT

An important barrier for a nationwide implementation of a daily physical activity (PA) at primary schools is the lack of spatial and human resources. Therefore, we developed a PA intervention that can be implemented without additional spatial resources or changes in school curricula. In the intervention group, children received a daily PA unit consisting of physical education lessons and simultaneous academic content over a 9-month period. The control group received conventional (physical education) classes. Body weight, height, waist circumference and health-related fitness parameters were measured. Of 412 children (9.7 ± 0.5 years) included, 228 participated in the intervention group. In regression analysis adjusted for baseline, gender, school location, sports club membership (total only) with standardized outcome variables, the intervention group showed a reduction in waist-to-height ratio ($B = 0.30, p < 0.001$) and an increase in several fitness parameters (cardiorespiratory endurance: $B = 0.20, p = 0.037$; lower body muscle strength: $B = 0.11, p = 0.041$; lower body muscle endurance: $B = 0.12, p = 0.027$; flexibility: $B = 0.19, p = 0.019$) compared to the control group. Intervention effects for cardiorespiratory endurance and flexibility were more pronounced in the group of children without sports club membership. Thus, especially children with no sport club membership seem to benefit from daily PA in school (**Trial registration:** DRKS00025515).

Read on... <https://doi.org/10.1080/02640414.2023.2259210>



SCAN ME

Tell me and I forget.
Teach me and I will remember.
Involve me and I will learn.

Benjamin Franklin

Post Covid Cardiovascular Complications and Management of Associated Risks

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Introduction

Covid-19 (Coronavirus 2019) disease is a condition categorised as a pandemic by the World Health Organization (WHO) on March 11th, 2020, that has caused casualties in millions till date. As per the data provided by WHO the total deaths recorded worldwide up to December 2022 was about 6,656,601 (Núñez-Gil, 2023). Clinical manifestations of Covid-19 have not been constrained to respiratory illness but has shown notable number of long-term complications in majority of patients effected with this virus (Nalbandian, 2021). Several studies have shown possible late complications which include venous thromboembolism (VTE), cardiac thrombosis, stroke, mood dysfunction and dermatological problems (Seyed Alinaghi, 2021). As per Carfi et al. (2020), cardiac manifestations are the most common complaints following Covid-19 infection.

Since from the early days, the association between Covid-19 and cardiovascular disease (CVD), has been the major risk factor in causing morbidity and mortality (Li B, 2020). Moreover, the post covid consequences related to recent cardiovascular implications even among the young and otherwise healthy have caused serious concern in health care systems worldwide (Barber C, 2020). As per the National Health Commission (NHC) of China, about 11.8% of in-patients had evidence of heart damage without having significant cardiovascular comorbidities (Zheng YY, 2020). Hence the current review was focused on summarizing the pathogenesis of cardiovascular abnormalities related to post Covid-19 exposure and its possible management.

Pathogenic Mechanisms

Several reports in literature have described the direct cardiovascular tissue damage related to Covid-19 infection. The various mechanisms causing cardiovascular damage in Covid-19 include Direct SARS-CoV2 invasion, Systemic Inflammation, Autoimmunity, and hypoxemia (Umbrajkar, 2021).

Direct SARS-CoV2 (severe acute respiratory syndrome coronavirus 2) infection on cardiac tissue has been observed upon examination of 39 cardiac tissue autopsy cases of patients who died of this infection, as the viral genome was found on the cardiac tissue of 24 (61.5%) of patients (Lindner, 2020). It may be because of the evident of affinity of SARS-CoV2 with that of the host angiotensin-converting enzyme 2 (ACE2), which shows the direct viral infection of the myocardium.

Moreover, the release of excessive cytokine, an immune response against the infection, causes inflammation, leading to direct cardiac injury (Weckbach, 2021). Several other evidence strongly supports the indirect cardiac damage. These studies state that the cardiac injury is indirectly related to the hypoxic condition due to respiratory failure (Babapoor-Farrokhran, 2020). However, the incidence of MI (myocardial infarction) associated with acute Covid-19 remains unclear. Overall, the mechanisms

of continuing post-acute infection related to cardiac injury is considered multifactorial. Further the development of autoimmune response towards cardiac antigens, is regarded as potential mechanisms for causing cardiac complications (Shah, 2021).

Risk Evaluation:

By considering the high risk of cardiovascular complications associated with post phase of Covid-19, it is highly mandatory to undergo comprehensive screening evaluation in individuals with a risk of post infection complications (Raman, 2022). The screening management and initial evaluation should include:

- a) A thorough observation of past Covid-19 history.
- b) A comprehensive evaluation of underlying symptoms.
- c) Analysing risk factors for cardiovascular complications like., obesity, diabetes mellitus, hyperlipidaemia, poor nutrition, stress etc.,
- d) Screening of physical, mental health.
- e) Observations of previous and current cardiovascular history.
- f) Assessment of current prescribed medications such as beta-blockers, ACE inhibitors, anticoagulants etc.,

Further, a complete cardiovascular system examination including complete blood count, troponin level, C-reactive protein, electrolytes, glucose test, ECG, echocardiogram etc., must be monitored.

Risk Management

Cardiovascular diseases include complex pathological implications hence the patients with Covid-19 need to be more conscious based on specific symptoms. One of the major comorbidities associated with Covid-19 is hypertension. Several studies stated that ACE-I/ARB's should be continued in patients suffering from hypertension (Prabhakaran, 2020).

Moreover, it is highly recommended that the patients with any structural and functional abnormalities in heart must undergo repeated ECG or echocardiogram for upto 1-3 months followed by 6 months observation.

Exercise interventions:

National institute of Health has recommended various valuable guidelines for management of activities and exercise in and post Covid-19 (Smer, 2022). Viz.,

- a) Asymptomatic or mild illness patients should not do exercise for minimum of ten days after onset of symptoms or if tested positive.
- b) Patients with moderate symptoms also should not do exercise for ten days even after resolutions of manifestations.
- c) Patients with severe illness should not do exercise for at least 14 days.
- d) Cardiology clearance is required for the patients with myocardial injury or arrhythmias before exercising.

In addition, patients with Covid-19 should not start

exercise for 3-6 months.

Conclusion:

Cardiovascular (CV) manifestations are a common in acute Covid-19 infection and even after its recovery. The different CV disorders include myocardial infarction, arrhythmias, deep venous thrombosis, and heart failure. As still the knowledge regarding the pathogenesis is unclear, suitable studies are required to evaluate the exact relation or interaction between SARS-CoV-2 and CV system. Hence in conclusion, understanding the diagnosis, treatment, and exercise interventions are important to prevent and manage the progression of CV disorders.

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Education is not
the learning of
facts, but the
training of the
mind to think

Albert Einstein



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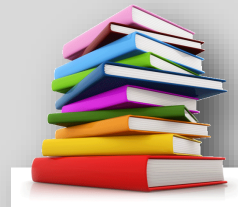
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FROM THE WORLD OF RESEARCH



URBAN LIVING LABS AS A TOOL TO ACHIEVE SUSTAINABLE DEVELOPMENT GOAL 16

Ozge Celik Yilmaz and Ozhan Ertekin

ABSTRACT

The article explores the potential of urban living labs (ULLs) to achieve Sustainable Development Goal 16 (SDG16) in the context of Istanbul, Turkiye. Focusing on the need for new approaches to addressing global challenges and local issues within a smart city approach, the research emphasizes the importance of ULLs. The findings reveal that the weakness of the local government and the unjust landscape pattern distribution in urbanization underlined the need for a new form of governance. However, ULLs have the potential to foster a culture of innovation and sustainability in urban governance. The ULL mindset can permeate the broader urban governance ecosystem, leading to the adoption of innovative policies and practices that drive sustainable urban development. However, defining the landscape pattern via planning and management system is crucial to understanding Turkiye's complicated governance. The findings contribute to the discourse on urban planning, offering a pathway for cities, including Istanbul, to navigate complex urban issues.

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