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Translational Practice-Based Methodological Model for Health and Wellness in COVID-19 Times

Valerie Ross[1*] & Abid Amir[2]

[1]*Faculty of Music Universiti Teknologi MARA, UiTM Shah Alam, 40450, Selangor, Malaysia*
dr.valerie.ross@gmail.com

[2]*Faculty of Medicine, Universiti Teknologi MARA, UiTM Sungai Buloh, 47000 Selangor, Malaysia*
abidamir@gmail.com

[*]**Corresponding Author:** Valerie Ross

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ABSTRACT

The COVID-19 pandemic has fueled interdisciplinary research and innovation in institutions of higher learning to combat rising physical and mental health issues. A robust research methodology is the foundation and quintessence of quality research output. As innovation assumes increasing prominence in translational science-art research, the process of interdisciplinarity within the research design itself is of growing interest but lesser known. This paper extrapolates the crafting of a Translational Practice-based Methodological model of interdisciplinary research to promote health and wellness. Multimethodologies comprising practice-based approach, user-centred design and design thinking strategies inform the model design. Central to the model is the 'User' and the innovative artefact of research flanked by considerations of sustainable development goals, theoretical framework, assimilating methodologies and applying translational practice.

Keywords: COVID-19 pandemic, health and wellness, translational practice-based methodology

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1. Background

The exponential waves of infections and fatalities brought on by the COVID-19 pandemic has shaken every fabric of society on a global scale. It has exposed the fragility of humanity and how science and social behaviour need to work hand-in-hand to overcome tragic consequences. Translational science-art research has become ever more relevant as medical solutions alone will be insufficient to upend viral infections unless accompanied by behavioural change, education, research and innovation. The World Health Organisation (WHO2021) reported that cardiovascular diseases are the number one cause of deaths worldwide taking an estimated 17.9 million lives each year representing 31% of global deaths. This is further exacerbated by the vicissitudes of the COVID-19 outbreak with increasing numbers of cardiac patients suffering post-COVID-19 cardiovascular complications and heart damage and depression. Given the serverity of the situation, unsurprisingly, the pandemic fuels translational research and innovation in institutions of higher learning to combat rising health concerns. Originating from the field of medicine, translational research embraces interdisciplinarity, seeking to apply fundamental research outcomes and translate such discoveries for the benefit of the targeted community, often referred to as 'bench-to-bedside' and 'bedside-to-community' research-in-practice (Rubio et al., 2010). At the heart of any academic study is its methodology. Hence, a robust research framework is the foundation and quintessence of quality research output. As innovation assumes increasing prominence in science and humanities research, the process of interdisciplinarity within the research design itself is of growing interest but lesser known particularly in the field of applied music and health-related research.

This paper extrapolates methodological dimensions of interdisciplinary research illucidating a model of practice-based research co-created by a composer and a cardiothoracic surgeon. Practice-based research, also referred to as practice-led research, recognises the creative artefact as a contribution to knowledge from both the means or process of the practice and the output of that practice (Smith & Dean, 2009). It is often associated with practice-led approach in which original research leads to new understanding about practice, and aims to advance knowledge about and within the reseach-practice itself. Therefore, the objective of the study is to extrapolate a translational practice-based methodological model for interdisciplinary research that promotes health and wellness.

COVID-19 infections are associated with cardiac injury thereby risking increased morbidity and mortality. It impacts on both the physical and mental health of sufferers with fatigue and increased risk of damage to the heart, lungs and brain (Long et al., 2020) .

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Cardiac rehabilitation is an interdisciplinary and interprofessional intervention customized to individual patients in four main phases of intervention comprising the clinical phase (acute phase, subacute phase), intensive outpatient therapy and independent ongoing conditioning. It aims to limit the psychological and physiological stress, reduce the risk of mortality and improve cardiovascular function and help patients optimise their quality of life , monitored by a diverse team of specialist healthcare providers. Central to rehabilitation is a structured programme of exercise and education designed to assist patients to return to optimal fitness and function after a heart attack or cardiac surgery (Achttien et al., 2013). Patient empowerment in hospitals and home-based cardiac rehabilitation support have never been more pertinent and urgent than in COVID-19 times. Translational medicine incorporates aspects of both basic science and clinical research, requiring skills and resources that are not readily available in a basic laboratory or clinical setting. Natural progression from evidence-based medicine to finding sustainable solutions for public health problem, hence the origins of the term from “bench to bedside” and “bedside to community” (Rubio, et al., 2010). Effective patient care requires the continuous improvement of knowledge on the pathophysiology of the diseases, diagnostic procedures and therapeutic tools available. Studies have found that music promotes cardiac health with calls for greater details about the musical and acoustical features of the therapeutic tool (Pittman & Kridli, 2011; Koelsch & Jäncke, 2015). What is lesser explored is an elucidation of interdisciplinarity through a practice-based model that positions the user at the centre of the study whereby the artefact of research is crafted, analysed and utilized for specific health and rehabilitative support. This study addresses this gap in knowledge.

2. Amalgating methodologies

The approach in crafting the Translational Practice-Based Methodological (TPBM) model was premised on the concepts of practice-based methodology, user-centred design principles and design thinking strategies. Signifying features of practice-based ethos and innovation are embedded in the model. Understandings of translational research in medicine provided key-stone concepts of ‘bench-to-bedside and bedside-to-community’ approach in the design of an interdisciplinary model by a physician and a musician. Interdisciplinarity embodies a synthesis of knowledge, ideas and specialisms from participating disciplines and associated fields of expertise strenghtening and broadening research-in-practice.

Fundamentally, practice-based research recognises the creative artefact as a contribution to knowledge from the means and process of the practice as well as the innovative outcomes of that practice. Practice-related research includes field-based research,

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multidisciplinary studies and participatory experiments. Collaborative Sciart (science-art) research has been funded by the renowned Wellcome Trust, a global foundation that focuses on health research (Glinkowski & Bambford, 2009). Researchers and practitioners from creative arts-humanities and science disciplines collaborate, share, integrate and create new knowledge as well as learn from each other.

Creativity is nurtured by design thinking strategies. Driven and refined by the explicit needs of users, a user-centred design approach coupled with design thinking strategies were found to be complementary in practice-based model building. User-centred design represents a collation of processes that positions the user in the forefront of each phase of the design process (Dopp et al., 2019).Embracing considerations of functionality, usability and accessibility, a user-design approach was also applied in the creation of a digital tool to promote mental health among health care workers (Ross & Amir, 2021). Design thinking encourages empathy and an ability to define problems, ideate , design appropriate frameworks and execute plans. In a review of design thinking among health care education, McLaughlin (2019) reported the importance and benefits of collaboration and the diversity of thinking especially among multidisciplinary teams during collaborative design processes stating that "design thinking was credited with helping participants refine problems and identify the appropriate needs with a human - or user-centered approach" in health education (p.5). An example of design thinking strategies which embraced cognitive concepts, strategic steps and practical processes in practice-based research planning using self-reflective questions aimed at promoting ideation among students of a research methodology class is illustrated in Figure 1.

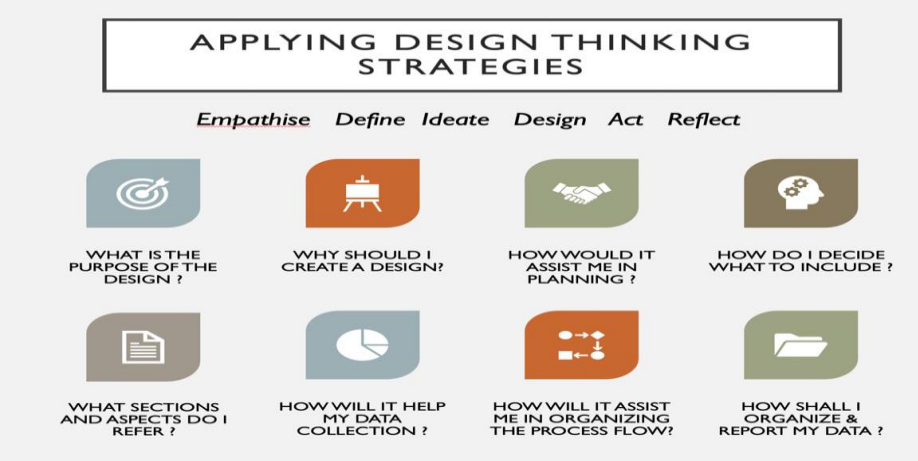

Fig 1 Self-Reflective Design Thinking Strategies in Practice-Based Research

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3. Result : A Translational Practice-Based Methodological Model

The result of this study is presented in the form of a Translational Practice-Based Methodological (TPBM) Model. The novelty of the model is that it places the user and the innovation at the centre of its conceptual design which is then flanked by four contemporary dimensions of translational practice-based research. The research artefact embraces innovation as the embodiment of its creation, especially crafted for use by the targeted community with the aim to promote health and wellbeing. These two central thrusts, namely the user and the innovative artefact form the *raison d'etre* of the model. A holistic approach is adopted in crafting the model, embracing fundamental and applied methodological techniques associated with translational research-practice, themed 'from bench-to-bedside, bedside-to-community of users.' Four dimensions flank this central thrust, both influencing it and being influenced by it. The dimensions, namely (i) sustainable developmental goals (ii) theoretical framework (iii) assimilating methodologies and (iv) applying translational practice are interconnected and related to one another. Embedded in the dimensions are elements of standard methodological processes and procedures in relation to the nature of the study undertaken. Figure 2 illustrates the TPBM model followed by extrapolations of its construct.

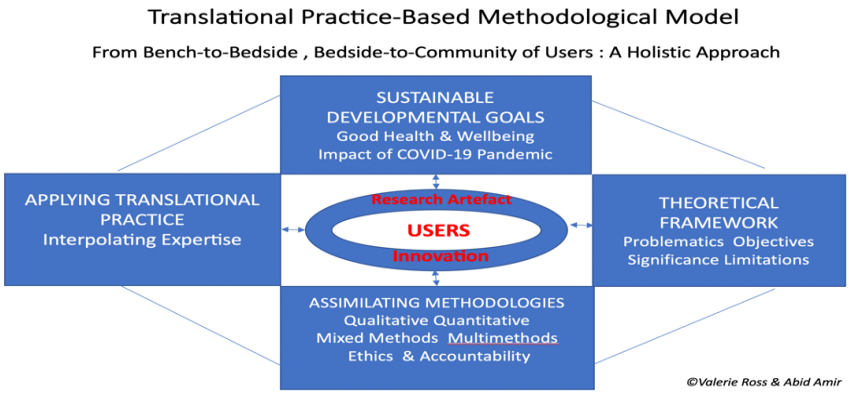

Fig 2 Translational Practice-Based Methodological Model

The United Nations reported that the COVID-19 pandemic had adversely impacted on major strides made in improving health and life expectancy among millions of people globally, describing the pandemic as a watershed moment for health emergency preparedness in the 21st century (UNESCO 2021) . Reference to the United Nation's Sustainable Developmental Goals (SDG) and the dire global health landscape are inevitable in discourse

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on health and wellness related research particularly in the COVID-19 era. SDG is the blueprint to achieve a better and more sustainable global future and they have become increasingly important as it influences the aims, rationale and methodologies that propel transformative research and innovation. SDG promote interdisciplinarity and inclusiveness.

Fig 3 UNESCO 17 Sustainable Developmental Goals

(Source https://en.unesco.org/sustainabledevelopmentgoals)

SDG is the first of the four dimensional components of the TPBM model. Good health and wellbeing represents the third of seventeen SDG propagated by the United Nations General Assembly in 2015. A collective attainment of this goal through multidisciplinary and innovative means to address widespread physiological and psychosocial distress has become even more crucial and critical in COVID-19 times and beyond. Universities around the world have embraced this challenge. The *Times Higher Education* 2021 Impact Rankings measured global performance of universities against the Sustainable Development Goals with participation from 1,117 universities across 94 countries / regions (THE2021). The methodology and metrics used was premised on research, stewardship, outreach and teaching. It took into consideration, the level of research and publication on health and well-being (27%), proportion of health graduates (34.6%) and collaboration and health services (34.6%). The ranking focused on the participating universities' research on the key conditions and diseases that have a disproportionate impact on health outcomes across the world, their stewardship for healthcare professions, the health of students and staff, their involvement in local, national and international community through outreach programmes and the training of skilled practitioners to deliver SDG in their careers. Participation by universities in this

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ranking demonstrates the commitment of higher education providers in addressing global issues faced by humanity and its environment.

The second dimension focuses on theoretical concepts and the purpose of undertaking research. A sound theoretical framework provides a healthy backbone to a piece of research. It humanises research. Theory building incorporates early considerations of theorectical principles and foundations upon which the research problem, hypothesis, objectives and scope are framed, developed and deconstructed as the research takes form. This domain considers problematics that warrant the study and its significance, all of which represent fundamental considerations which propel research activities. This is coupled with a review of literature to ascertain extant knowledge and in the area of health-related studies, an engagement of associated clinical guidelines to support case construct and good practice (Panteli et al., 2019). Rivard (2020) argues that theory building is neither science nor art but a craft, postulating construct and cohesion as pillars of crafting emergent theoretical premise of a research endeavour.

The third dimension is represented by an assimilation of methodologies in the TPBM model. Methodology is the mainstay of any research. Literature on the nature, characteristic, types and analytical techniques of qualitative, quantitative and mix method research as well as multimethod research have been well documented (Creswell, 2009; Flewitt et al., 2019). Components of this dimension is concisely explained as follows. Qualitative methods focus on naturalistic settings, using a combination of verbal narratives, use words, images sounds or action to describe and intepret meaning. A smaller sampling size affords greater personalised responses and interpretations of multiple realities and modalities which may be rooted in the subjects' perceptions and practice. Data collection means include individual and focus group interviews, participant observation. Types of research include historical, ethnographic, ethnomusicological studies, action research, grounded theory, case studies, practice-centred and translational research (Ross, 2018). Conversely, quantitative research emphasizes on numbers to represent data from a larger sample size, engages standardized research instruments to measure variables, collect and analyse numerical data which are represented in tables, graphs and figures focusing on outcome validity, reliability, replicity and predictability. The main types of quantitative research are descriptive, experimental, correlational, causal-comparative and survey studies. As the term suggests, mixed methods research incorporate primary and secondary data acquisition techniques from both qualitative and qualitative methods such as a combination of questionnaires and interviews in order to acquire and facilitate data integration. This collation of data types offers a richer view of the

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research landscape studied in order to enhance validity, reliability and diversity of research outcomes appropriate to the objectives of the study. Additionally, multimethodology is used to describe the engagement of more than one method of research approach. Therefore, mix method and the use of multimethod research are particularly relevant in translational practice-based research due to the interdisciplinary and collaborative nature of TPBM inquiry. Aditionally, ethics and accountability in health-related research require some of the most stringent ethics approval processes from University Ethics committees which adopt research ethics guidelines outlined by the Helsinki Declaration agreed by the World Medical Association and Council for International Organisation of Medical Sciences (UiTM Ethics and Publication Unit, 2021). Ethics applications include a declaration of risk levels of the study based on the type, nature and size of the sampling frame, data collection techniques and instruments used, inclusion and exclusion criteria, vulnerability of participants and analytical tools engaged.

The fourth dimension focuses on the application of translational practice in the research process. Translational practice-based research is naturally interdisciplinary requiring a collaborative interpolation of expertise and authentic co-creational thinking from contributing fields. Interdisciplinary and translational studies involving science-arts disciplines are particularly demanding in that both convergent and divergent angles of research approaches and ethos require careful consideration and assimilation in order that fundamental and applied processes are effectively constructed within the design of the methodological model to serve the targeted community of users.

To summarise, the four dimensions postulated individually and cumulatively point to the needs of the end-user, facilitated through expert and specialist knowledge in the crafting of the innovation and teamwork in facilitating the use of the innovation, thereby translating research in and through practice from conception to community use as a holistic process. This TPBM model has been applied in the creation of the ‘Bespoke Music and Narration’ (BMN) audio-visual collection of original artefacts of practice-based research comprising of music, narration, scripts and poetry to support complementary therapies and rehabilitation regimes in promoting health and wellbeing among disadvantaged communities. Each artefact is uniquely identified through spectral analysis, a visual manner of representing and analysing loudness or signal strength of sound in various frequencies as it changes over time, depicted in waveform sonograms. A webinar on ‘BMN: Translating Music-Medicine Research-Practice’ was presented by the authors at the Cambridge Festival (2021). Figure 4 illustrates a

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sample of innovative artefacts belonging to the Bespoke Music and Narration Collection that have been crafted for different phases and types of cardiac rehabilitation support.

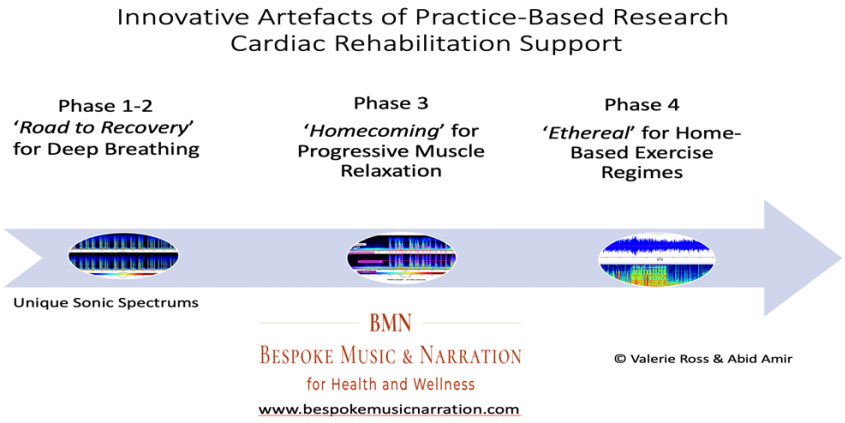

Fig 4 Innovative Artefacts of Practice-Based Research

4. Conclusion

The COVID-19 pandemic has shaken humanity, galvanizing universities, governments and societies to address unprecedented demands on community and personal health and wellness management. Innovation has assumed pole position in research with SDG propelling the practice of multimethodologies through interdisciplinary research, reinforcing the need to offer new ways in delivering health-care that is dynamic, on demand, cost-effective, impactful and innovative. Translational practice-based research transcends fields and domains of knowledge and expertise. The TPBM model posits a novel contribution in addressing translational research approach in relooking at practice-based methodology through the lens of the user, the artefact and four dimensions of research activities. Its elucidation concluded with the practice of this model in the development of the 'Bespoke Music and Narration' collection of artefacts for translational research in developing an armamentation of tools to support health and wellness among disadvantaged communities affected by the COVID-19 pandemic.

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