BRIEF REPORTS

Creating an Inclusive Ecosystem through Healthcare in Disability Management: Malaysians' Experience

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ABSTRACT

Purpose: *MyRehabMaker is a community initiative project utilising technology as an innovative platform to solve the challenges of people with disabilities specifically, and of society as a whole.*

Method: *Providing an Assistive and Adaptive Device (AAD) is one of the interventions to assist people with disabilities in improving their functional level. The AAD prescription work process was enhanced by forming an expert multidisciplinary team and introducing 3D printing technology into practice.*

Results: *This project has been recognised and has won a few awards in innovation exhibitions and competitions. The project later expanded into the community to encourage community involvement and contribution.*

Conclusion: *The project framework aims to address the needs and interests of participating bodies and promotes inclusivity by adopting community-based rehabilitation and social innovation principles on the IR 4.0 healthcare platform.*

Keywords: *rehabilitation medicine, assistive technology, disability, Malaysia*

INTRODUCTION

A good community programme should identify and address the existing issues within the community in a holistic manner. Innovation plays a vital role in empowering communities and sustaining the community programmes. Appropriate technology can be positioned as the bridge leading to the empowerment

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of marginalised communities. The objective is to create an innovative platform to provide solutions for addressing problems at every community level. This programme also encourages the partnership and collaboration of stakeholders across government, academic institutions and the nonprofit sector. It should lead to benefits for the specifically targeted community as well as fulfil the interests of every participating body.

The authors of the current article demonstrate this with their community initiative project that adopts an affordable and adaptable 3D printing technology in the prescription of Adaptive and Assistive Devices (AADs) for people living with disabilities. This project was first started as a research practice and later translated to benefit society by capitalising on the available resources and maximising the community potential to develop a sustainable project that provides solutions for people with disabilities specifically, as well as for society as a whole.

Upgrading AAD Prescription Service in Disabilities Management

An Assistive and Adaptive Device is any form of device or technology which has the primary function of maintaining or improving an individual's functional and independence level by addressing impairments, facilitating participation, and enhancing overall well-being (Yeung et al, 2016). According to the World Health Organisation survey (WHO, 2016), globally, more than 1 billion people require one or more assistive products. However, in many low- and middle-income countries access to these adaptive devices is limited, with only 5% to 15% of the population of people with disabilities having access to such devices (WHO, 2015). The Convention on the Rights of Persons with Disabilities has now recognised access to assistive technology as a human right and has called for international cooperation to improve its accessibility (WHO, 2015).In Malaysia, the total reported number of people with disabilities registered at the Department of Social Welfare in 2017 was about 453,258 persons. The majority are people with physical disabilities (35.2%), followed by those with learning disability (34.8%) and visual disabilities (8.9%) (Department of Social Welfare,2018). Acknowledging the increasing number of people with disabilities and their need for AADs, the United Nations resolutions recently included the importance of access to assistive technology in realising the targets set in the Sustainable Development Goals relating to universal health coverage (WHO, 2016).

METHOD

Assistive and Adaptive Device prescription in the local clinical setting is dependent on and limited to what is available in the market or produced by occupational therapists via conventional methods. The complex design of ADDs in Malaysia is difficult to develop due to outdated technology, lack of required technical skills, materials, and multidisciplinary involvement and collaboration. Acknowledging this problem, an expert multidisciplinary team was created, consisting of a rehabilitation physician and technical experts to allow crossover of knowledge and utilisation of existing 3D printing technology to develop customised AADs specific to a diverse set of disabilities. This framework allows a suitable and conformable AAD to be prescribed to effectively address impairment, hence helping to achieve the optimum functional level and reduce the dependency level. Figure 1 and Figure 2 depict the framework and work process of this AAD prescription service.

Figure 1: Multidisciplinary Framework in AAD Prescription

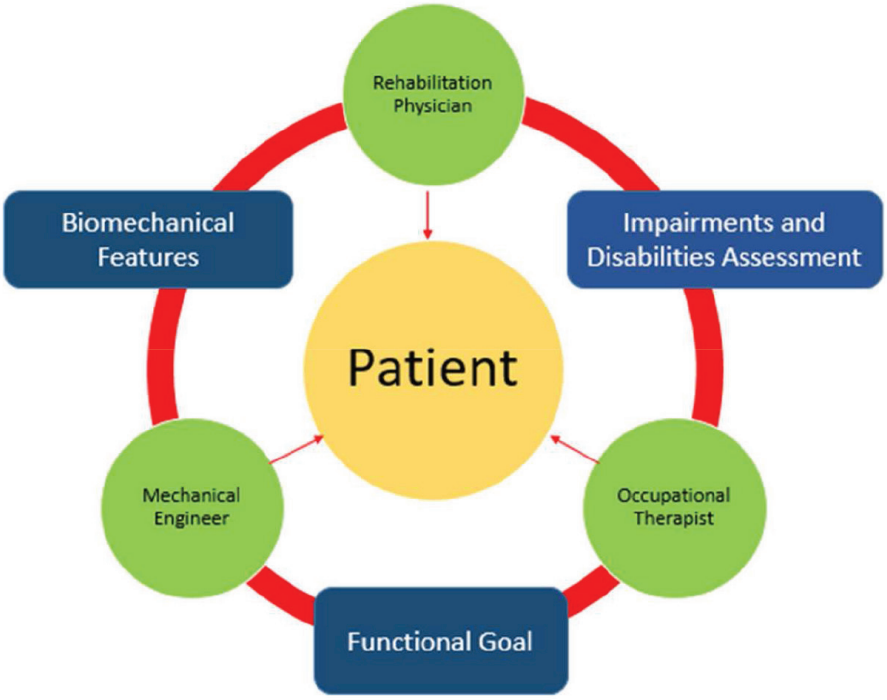


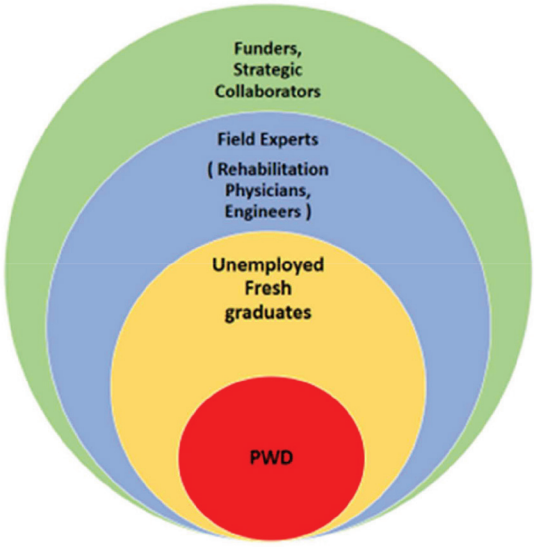
Figure 2: Work Process of AAD Assessment, Prescription and Development

AAD Prescription: Towards Promoting Community Involvement

This project was inspired by the concept of community-based rehabilitation (CBR). Historically, CBR provides rehabilitation services to people living in low- and middle-income countries through local community resources (Khasnabis et al, 2010). The CBR concept outlook has evolved into a broader development strategy, varying in practices and contexts depending on the available resources (Khasnabis et al, 2010; Chung, 2019). In the reported project the same goal and aspiration of CBR was adopted, i.e., ensuring that people with disabilities can access rehabilitation services that contribute to their overall well-being, inclusion, and participation (Khasnabis et al, 2010). Sustainable CBR programmes are dependent on several factors, which are: (i) the availability of well-equipped human resources; (ii) appropriate and practical training, monitoring, and evaluation; and, (iii) collaboration, commitment, and the necessary financing of programmes (Thomas, 2011). This project too was driven by the social innovation concept that was broadly described as a process of deploying solutions to overcome challenges in systemic society in support of social progress (Van der Have & Rubalcaba, 2016). The solutions may consist of ideas or strategies to address deeply-rooted societal problems in education, employment, healthcare, community development, and livelihood (Van der Have & Rubalcaba, 2016).The

researchers combined the understanding of both concepts to develop a viable framework that attempts to fit the local society's needs. Ideally the framework should address issues of people with disabilities specifically, but it aimed at solving problems or meeting the interests of other participating members in society as well. Therefore, it was expected and hoped that this would be a sustainable project.

Figure 3: Project that Encourages every Community Level Involvement



Unemployment: From a Problem to a Window of Opportunity

The rate of unemployment in Malaysia has demonstrated a rising trend to 4.7% in August 2020 from 3.3% in the corresponding month of the previous year, amid the severe implications of the COVID-19 pandemic. The number of unemployed people surged from 42.6% a year earlier to 741.6 thousand, while employment declined by 0.2% to 15.15 million (Department of Social Statistics Malaysia, 2020). A report on the second quarter of the year 2020 demonstrated a decreasing number of total job availability in the private sector with 236 thousand year-on-year to 8.383 million (Department of Social Statistics Malaysia, 2020). In the meantime, job vacancies dropped to 170 thousand, with a vacancy rate of 2.0% (Department of Social Statistics Malaysia, 2020). Job markets have become very competitive, and only small numbers of fresh graduates can land jobs that match their educational backgrounds within the local industries. This scenario provides a window of opportunity to use local talent with technical expertise

and skills as a problem-solving strategy to assist in developing and innovating in the AAD prescription service. The researchers recruited them to be part of the technical team in developing AADs by training, monitoring, and providing some financial support. The objectives of this recruitment were: (i) to increase the marketability of the graduates by providing them an avenue to apply their knowledge to practice, (ii) to improve their economic status by helping them to earn an income, (iii) to educate them on the needs of people with disabilities and their possible challenges with function, and (iv) show how they can contribute to use their newly-learned skills in a way that would best serve the needs of people with disabilities.

Translation of a Research Practice into a Community Project

This project was first started as a research exercise to establish a framework integrating multidisciplinary expertise in upgrading current rehabilitation service in AAD prescription in an institutional setting (Mazlan et al, 2021; Othman et al, 2021). It was realised that this project could potentially be expanded, involving other community members at different levels as well. The lessons from the research project are fundamental in providing training and consultations to ensure that recruited graduates receive adequate training in developing AAD products that serve the intended function and meet certain quality standards. The training, monitoring and evaluation allow: (i) knowledge transfer from academic and industrial experts to the community, (ii) continuity of the academic exercise and continuous contribution to the body of knowledge pertaining to product development and innovation, and (iii) demonstrate a good academic research exercise to translate the research output into the community in a practical viable way.

Diversify Corporate Social Responsibility Performance

Financial support remains important and plays a significant role in ensuring sustainable and successful developments in any community programme. A viable framework and proper planning by the anchoring body in the reported project is the University, which is crucial in attracting funds from those who finance research grants, as well as governmental or non-governmental organisations. The project must demonstrate: (i) a proof of concept, (ii) a viable and workable process, (iii) value of the scientific output, (iv) the impact of the project towards current practice, and most importantly, v) how and to what extent the community will benefit from such a project. This project will not only attract monetary contributions but

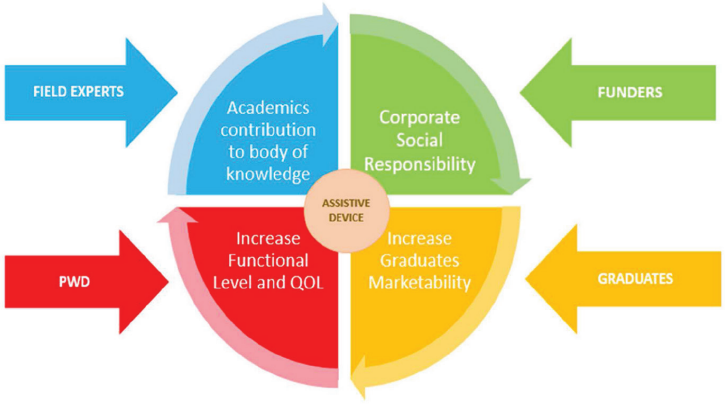
also knowledge, skills and technology sharing, thereby strengthening academic and industrial strategic partnerships. The resources are well shared at every level of the community, thus making the investment worthwhile for the whole society.

RESULTS

Project Outcomes

This project is expected to generate a few impactful outcomes: (i) innovative functional AAD products, (ii) additional value-added skills for a marketable graduate, iii) upgrading the current state of rehabilitation services, and (iv) promoting the inclusion of people with disabilities in the community. Figure 4 depicts how this project can be beneficial to participating communities. To date, there are several ongoing and completed projects. Examples are the Tenodesis Grip Enhancer Orthosis, the Writing Finger Orthosis, the Forearm Wheeler Writing Orthosis, the Cosmetic Transfemoral Prosthesis, the Large Handle Gripper, the Plate Based Rotator, the Customised Wheelchair Mounted Table, and the Upper Limb Writing Orthosis, to name a few. Funding was received from a research grant and a few strategic collaborations with industrial partners. Five graduates who were successfully recruited and trained were actively involved in developing the AADs. Recently an association was registered under the name PINTAS (Malaysia Association of Technological Assistive Devices) as an official platform to recruit more technologists and attract more funders to engage in the AAD development activities. This project has been recognised and has won a few awards in innovation exhibitions and competitions.

Figure 4: Project Output impacting at every level of Participating Communities



DISCUSSION

To establish a successful programme, the researchers believe that a community project must address the needs of a specific community and address the community interests as a whole. The adopted strategies should be directed towards people with disabilities specifically and indirectly benefit the other group of communities in addressing their specific problem or specific interest as much as possible. This project provides an excellent avenue to assist Malaysia in fulfilling the agenda of globalisation in areas of the sustainable development goals (SDG) by actively embracing and adopting IR4.0 in delivering the rehabilitation services. The project outcomes will help reduce the rate of unemployment and encourage the inclusion of people with disabilities in society by connecting people without disabilities with the people with disabilities, instead of the other way round. Ideally, a community project has to be universal and not exclusive. It should be inclusive by encouraging participation of all community members.

Consequently, the reported project helps in providing an in-depth understanding of the issue of people with disabilities in society at large. These strategies may successfully build interest and maintain enthusiasm, as well as attract collaboration and financing opportunities for similar projects. It is hoped that this project will be sustainable in the long run for its clinical applications, availability of required skills and talents, ongoing collaborations, and cost-effective operational costs that are yet to be determined. It is envisioned that this initiative may evolve into a community-driven project and run independently to ensure the inclusion of all society members.

CONCLUSION

It is believed that this project can encourage and promote good collaboration at and between every community level, maximise potentials, and deliver impactful outcomes in driving Malaysia towards achieving the agenda of the Sustainable Development Goals.

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