Program title: "Bringing the Drive Focus app to Australia"

Please provide a brief overview of the program.
Drive Focus is a tablet application that teaches users "visual search skills" for driving through interactive video. Occupational Therapists working with people with cognitive and neurological conditions/disabilities, frequently see that visual search skills are compromised – they "look but don't see".

In the Drive Focus app, users learn to identify, prioritize, and react to 11 "critical items" – the critical visual stimuli on the roadway through *tapping on* videos taken from the driver's point of view. Using a unique technology, items within the videos are made to be tappable. Users learn to *tap on* pedestrians, traffic lights, road markings, stop signs, construction signs and more. Users also learn to tap on critical stimuli in order of priority, such as clicking on the brake lights of the vehicle in front before tapping on the green traffic light.

Driving Well Occupational Therapy based in Brisbane and Driver Rehabilitation Institute based in the USA collaborated to adapt Australian content for Drive Focus. The collaboration makes this low cost tool ($16.91 AUD) accessible to therapists, driving instructors, and their clients/students. At a time when the pandemic interferes with in-car practice, this application makes it possible to address a fundamental driving skill without being in a car.

In more detail, please explain how the project was administered. Include detail such as the main processes used, set up, resources required and frequency of delivery.
(Refer to Judging Criteria section of the Submission Information Pack)

   • The Overall Concept – What is the overall concept of your road safety program?
   • Impact - What is the overall impact of the project? This includes both external and internal factors.
   • Adaptability - To what degree has the project been adapted to its target market?
   • Sustainability and Commitment - How sustainable is the project/initiative? And if in the initial stages, how committed is the project to making a difference to road safety?
   • Research, Awareness and Reliability - Has any degree of research been done? How aware is the Australian and/or local community of the project? Is the project reliable and does it work?

Driver Rehabilitation Institute (DRI) is a charitable US organisation founded in 2005. The organisation's mission is to advance road safety globally through education, programming, and technologies. As part of that mission, DRI launched Drive Focus in 2016. The research and development of the Drive Focus spanned four years. During that period, DRI developed technology to make real videos as opposed to computer generated films clickable or *"tap-able"*. Drivers need to identify multiple fast moving objects, our clickable hotspots in the video have been designed to track multiple fast moving objects - an achievement not done before. Furthermore, we included a feature to allow the user to slow down the video and have the clickable overlay flawlessly track the item at the reduced speed. This is a <u>critical</u> feature for individuals that are learning to drive or those that have cognitive deficits due to

medical conditions such as stroke, Parkinson's disease, and
multiple sclerosis. In addition, we conducted usability testing with typical teens and special needs
teens (Monahan et al., 2020). Based on their comments and the observations of research
assistances we refined the application to adhere to usability principles.

Drive Focus uses video obtained from a high-quality camera mounted on the roof of a car above the
driver and audio obtained from microphones exteriorly mounted. The result is realistic, first-person
perspective video of driving complete with 3D sounds (e.g., jack hammers, airplanes overhead,
passing semi- trailers, etc.). Drive Focus videos are both realistic and interactive, a combination that
enables users to generalize the visual search skills learned on Drive Focus to actual driving. Hence,
Drive Focus is a wonderful compliment to driver education and driver rehabilitation.

The drivers filming the videos are occupational therapy driver assessors and driving instructors
demonstrating good driving behaviors. The drivers film roads that span busy residential to
downtown traffic. DRI, trims the videos to approximately 3 minutes in length. Through a detailed
process the videos are encoded with hotspots to make the critical visual stimuli clickable. Each 3
minute video takes approximately 8 hours of encoding. Seven 3-minute length videos are organized
within a location based on level of difficulty. For example, the seven videos of Brisbane were put
together as a Tour. Within the Brisbane Tour, there are three levels of difficulty. Two videos are
included in each level. Level one is busy residential, level two is moderate business traffic, and level
three is downtown traffic. We also include a "bonus" drive which is a scenic drive in the local area.

Teaching visual search skills for driving is very difficult to do while simultaneously teaching
maneuvering skills. Without eye tracking technology it is nearly impossible to know what the driver
is looking at on the roadway. Further, it is extremely difficult for clients with medical
conditions/disabilities to learn visual search skills at the same time as learning vehicle operation
skills.. With Drive Focus, the user fixates on the target long enough to tap the critical item on the
screen. The Drive Focus app provides detailed information to the instructor/therapist on what the
client identified as critical in the scene, how quickly they identified it (reaction speed), and whether
they selected the items in the correct order of priority.

A university study identified that six one-hour sessions of Drive Focus significantly reduce driving
errors among learner drivers (Alvarez, Classen, Medhizadah, Knott, & He, 2018). As part of the study,
subjects rated the value of Drive Focus. The subjects rated Drive Focus as valuable for improving
their driving skills (Alvarez, Classen, Medhizadah, Knott, Asantey, et al., 2018). There are other
studies taking place in the USA and Canada to examine the efficacy of Drive Focus with populations
such as stroke, autism, and combat veterans with post-traumatic stress.

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Tell us about your journey. When was the program started? What were your goals and their reasons? Were you successful in achieving your goals? Why/Why Not?

Learning to drive with a physical/psychosocial disability, returning to driving after an accident, and maintaining driving through ageing, are all rated as top priority goals for people in these situations. With the roll-out of the National Disability Insurance Scheme, exploring the feasibility of "learning to drive" has become a possibility for many young Australians who are on the Autism Spectrum, or who have other psychosocial disabilities (eg Asperger's, anxiety or mental health conditions). This has been a growing area for Occupational Therapists, with the actual practice of driving assessment and training being delivered at a higher frequency than research and evidence being able to take place.

Jenny Gribbin is an Occupational Therapy Driver Assessor and Director of Driving Well Occupational Therapy in Brisbane. She founded her practice in 2017 and during this time continued to service the population of young people with psychosocial disabilities, as well as drivers with brain injuries/neurological conditions wishing to return to driving or continue driving. This area is extremely challenging, with client expectations usually extremely high, and outcomes of being successful difficult to predict. Aside from driving lessons with a specialised driving instructor (utilizing NDIS funding), there didn't seem to be many other strategies or tools available to optimize this populations chances of being successful with their goal.

Jenny's goal was therefore to review the literature and marketplace, to find people, strategies and/or tools that would be able to complement the existing processes for learning to drive / driving rehabilitation in Australia.

Due to COVID-19, Jenny was unable to see clients at her business in Brisbane between March to May 2020 due to social distancing requirements. She decided to use the time to learn more about Autism and driving. Through a web search, she found Dr Miriam Monahan, an Occupational Therapist and driver rehabilitation specialist in California USA. Dr Monahan had co-created Drive Focus which was being used in the USA and Canada for new drivers as well as individuals with medical conditions. Jenny immediately saw the benefit to many of her client populations – and realized she had achieved her initial goal to find people/strategies/tools; however the application would need to be adapted for driving on the left side of the road. The two occupational therapists decided to collaborate on a business venture of to adapt Drive Focus and bring it to Australia.

There was an involved and lengthy process to develop the app for the Australian context. Jenny attached a Go-Pro to the roof of her vehicle and gathered several hours of footage driving through the greater Brisbane area. Jenny edited the training section of Drive Focus and identified the critical items for the Australian context and ensured the language made sense to our audience. There were multiple drafts of the training section to ensure that the content was applicable to the Australian context. The DRI team trimmed the video footage to seven videos 3-minutes in length. The DRI team added clickable hotspots to the video to make them interactive. The DRI team consulted Jenny for accuracy of critical items. In addition, Jenny reviewed the videos and provided a description of each video based on the location. After three months of work they launched the new version of the Drive Focus app on Google Play and the AppStore with the Australian content.

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Jenny is actively involved in OT Australia (the national professional association for Occupational Therapy) and has held positions on the QLD branch of the Driving Special Interest Group for the last five years; she also founded a professional facebook page to support Occupational Therapy Driver Assessors throughout Queensland, and then nationally.

Jenny used her networks to organise workshops and webinars for occupational therapy driving assessors and specialized driving instructors in Australia. Topics included medical conditions where visual search skills for driving can be compromised. Populations discussed during the workshops and seminars included autism, stroke, traumatic brain injury, multiple sclerosis and Parkinson's disease. So far, they have provided 26 hours of online education that has introduced Drive Focus to approximately 80 Occupational Therapy Driver Assessors and specialised driving instructors across Australia, noting that this is a niche area with minimal therapists/instructors working in this area of practice; the workshops already delivered have targeted approximately 60 – 70% of this primary stakeholder group. This is a significant impact in this small industry.

Jenny was also on the Organising Committee for the recent OT Australia conference "OT Exchange" in September 2020 (delivered virtually across the country for the first time), which included a stream on driving and vehicle modifications; Dr Monahan was invited to present a clinical paper on visual search skills and further introduced Drive Focus to Occupational Therapists in Australia (to an audience of about 200 therapists live on the day, with a one-month viewing available to almost 1000 therapists).

Since the launch in July 2020, more than 70 Drive Focus apps have been sold in Australia.

Further workshops are planned for general Occupational Therapists, Allied Health Assistants, Support Coordinators and Support Workers, and parents to help them to identify if their young person with a disability is ready for learning to drive, and what they can do to prepare them for this journey. The Drive Focus app being a clinically proven tool, is an important piece of the puzzle, and it is expected that awareness and uptake of the Drive Focus app will significantly increase throughout 2021.

Driving Well Occupational Therapy and the Driver Rehabilitation Institute team now have a goal to expand use of the tool across Australia in the medical/disability population and the general new driver population as we know it works, is easy to use, cost effective, and ultimately fun.

Jenny became aware of the Australian Road Safety Foundation and met with Driver Safety Australia in October 2020, and was encouraged to submit this nomination to the awards. It is hoped that this award nomination in itself, and potentially a win in the Technology category, will also increase the awareness of Drive Focus through the medical/disability field of driving, and also introduce it to mainstream learning to drive and general driving safety.

Please provide detail on the outcomes of the program and how they were measured. Include all specific detail here such as the number of people engaged or impacted and if applicable, the mediums that were used to reach them and the number of locations at which the program was delivered. Have your goals changed as a result of the knowledge you have gained in implementing your program?

Jenny's initial goal was to find people/strategies/tools that would better equip her and support her clients with psychosocial and neurological disabilities to optimize their success in achieving their goal of learning to drive or returning to driving. She achieved this when she found Dr Miriam Monahan and the Drive Focus app.

The next goal was to introduce the Drive Focus app to the Australian OT Driver Assessors, to make them aware of the program so they could use it in their driving assessment / rehabilitation practise.

To date, Jenny and Miriam have facilitated:
- Driving and autism workshop delivered twice in May 2020 and again in August 2020; this was a 2 part (8 hours total) workshop through zoom;
- "Keeping an Eye on It": 2 hour webinar regarding visual impairments in neurological conditions (including visual search deficits and introduction of the Drive Focus app);

These workshops had a target audience of Occupational Therapy Driver Assessors and "specialised driving instructors" (with experience in working with clients with medical conditions and disabilities). Workshops were advertised on the professional facebook page and through the OT driver assessor networks; across the three workshops, there were approximately 70 participants who were from metro and regional areas across Queensland, New South Wales, Victoria, Tasmania, South Australia, Western Australia, as well as research assistants from USA and an OT driver assessor from South Africa.

The "Keeping an Eye on It" webinar had 20 participants across metro and regional Australia, about half who had already completed the autism and driving workshop.

None of these participants had prior knowledge of Drive Focus; the workshop included a small section about the app for introduction and awareness raising, and thoroughly covered the R&D and pilot efficacy study; first question from everyone was whether there was a "left-side driving" option, and when Dr Monahan explained that Jenny had worked with the DRI team to adapt the app to the Australian context, there was an amazed response.

In her own practice at Driving Well Occupational Therapy, Jenny has adapted her approach for the "learning to drive" population; she introduces the concept of critical items and assesses visual search skills on-road whilst the client is a front passenger and the driving instructor is driving the vehicle. Following the full assessment, Jenny determines whether the client is showing "potential to drive" – these clients will then be recommended to have driving lessons funded through their NDIS plan, and are supported to purchase Drive Focus, and have a plan to commence using this with parents and support workers.

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One young lady with high functioning Autism in particular was struggling with her "scanning" – her parents stated that at intersections she seemed to be looking but not seeing; she started using Drive Focus and did practice with her parents – they noticed an immediate difference on-road – her practice to work on her visual *searching* skills ("what" to look for), translated in her being able to look for the critical items on the road. She had been able to improve this aspect of driving *outside* of the car, which made it easier for her to integrate this skill when behind the wheel.

Jenny is exploring further options about how she can implement Drive Focus into her practice as a therapist/assistant-led program, in conjunction with parents and support workers using the app with young people, to best support them with their goal of learning to drive. Driving Well Occupational Therapy is committed to making the use and roll-out of Drive Focus sustainable across their practice and throughout Australia.

References

Alvarez, L., Classen, S., Medhizadah, S., Knott, M., Asantey, K., Wenqing, H., Feher, A., & Moulin, M. S. (2018). Feasibility of DriveFocus™ and driving simulation interventions in young drivers. *OTJR: Occupation, Participation and Health*, 1-9. https://doi.org/https://doi.org/10.1177%2F1539449218787495

Alvarez, L., Classen, S., Medhizadah, S., Knott, M., & He, W. (2018). Pilot efficacy of a DriveFocus™ intervention on the driving performance of young drivers. *Frontiers in Public Health, 6*(125), 1-9. https://doi.org/10.3389/fpubh.2018.00125

Monahan, M., Brooks, J., Seeanner, J., Jenkins, C., & Monahan, J. (2020). Driver training application for individuals with Autism. *Assistive Technology Outcomes and Benefits, 14*(Spring 2020), 77-93.

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Appendix

<u>The users' experience:</u>

Drive Focus is available on Apple and Android tablets. After logging onto the application, the user takes a training tutorial that teaches them to identify 11 categories of critical items on the roadway. The categories help the user direct their attention more effectively on the road. See Figure 1.

Figure 1: Icons represent the 11 critical item categories. After selecting the critical item icon, the user learns more details about each of the critical items.

Each critical item category is introduced with why it is important to notice on the roadway. See Figure 2.

Figure 2. After the user selected regulatory sign icon from Figure 1, the app provides details about regularly signs and why they are important.Users also learn how to prioritize critical information See Figure 3.

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Figure 3. The vehicle entering from the left and the yellow traffic light are both critical. However the vehicle entering from the left is a higher priority over the yellow light as the driver may need to slowdown or stop. In this scenario, the user is instructed to click on the vehicle entering before the yellow light.

Once the user has completed the training section, they are directed to the Tours where they interact with the videos by clicking on the critical items in order of priority. See Figure 4.


Figure 4. This is an image of a user tapping on the video.

At the end of each drive, the user receives an overall score out of a possible 1000 points. A score of 500 or greater of each drive contained within a level advances the user to the next level of drives. For example, on the two Level 1 drives a user receives a 680 and 700. Because these scores are greater than 500, the Level 2 drives are unlocked (see Figure 5). The users can review their performance by examining their scores in detail. For each critical item that appeared, in the video they can see whether they identified it or not, whether they selected it in the right order of priority, and how quickly they responded. See Figure 6.
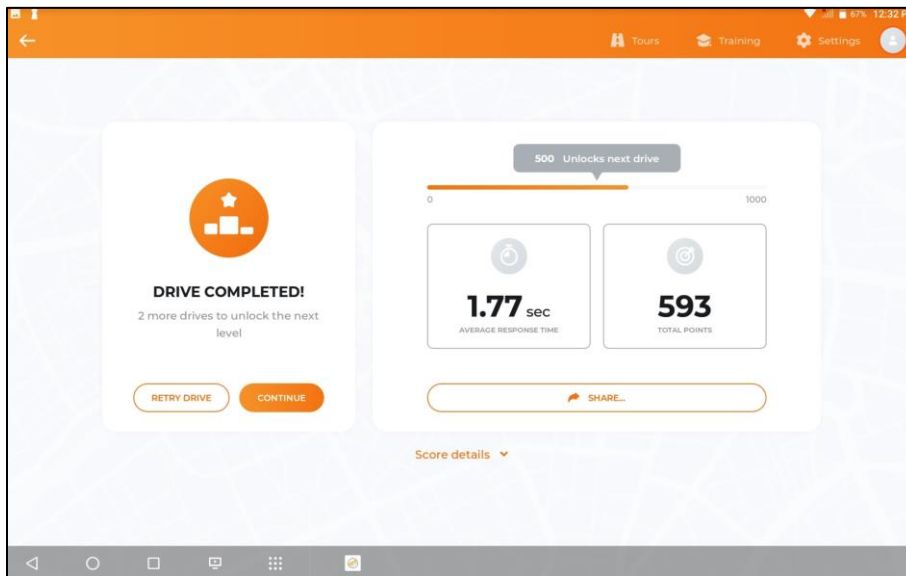

Figure 5 illustrates the overall score the user receives after completing a drive.
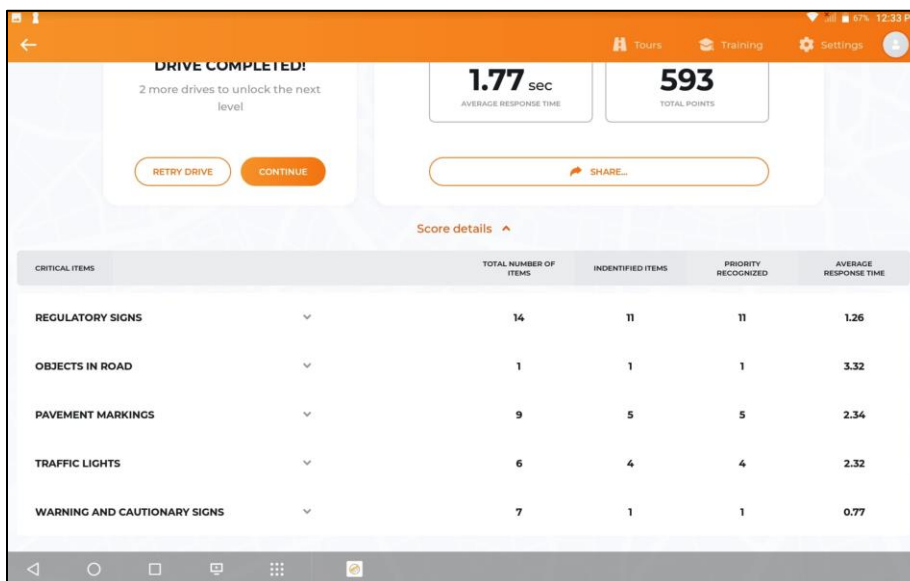
Figure 6 illustrates the score detail based on each of the 11 critical items that occurred in the previous video. For example, there were 14 regulatory signs, but the user only identified 11. For the 11 they identified they selected them in the correct order of priority. If the user wants to see the

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regulatory signs that they missed, they can select the down
arrow and play a 3 second segment of the video where the missing item was contained.

For the Android version there is an additional feature where a user can share their scores with their instructor or therapist. Through a free website, the instructor or therapist can view their client's performance across different drives, levels, and over time. It allows the instructor or therapist to quickly identify trouble spots and provide coaching and further instruction. See Figure 7.
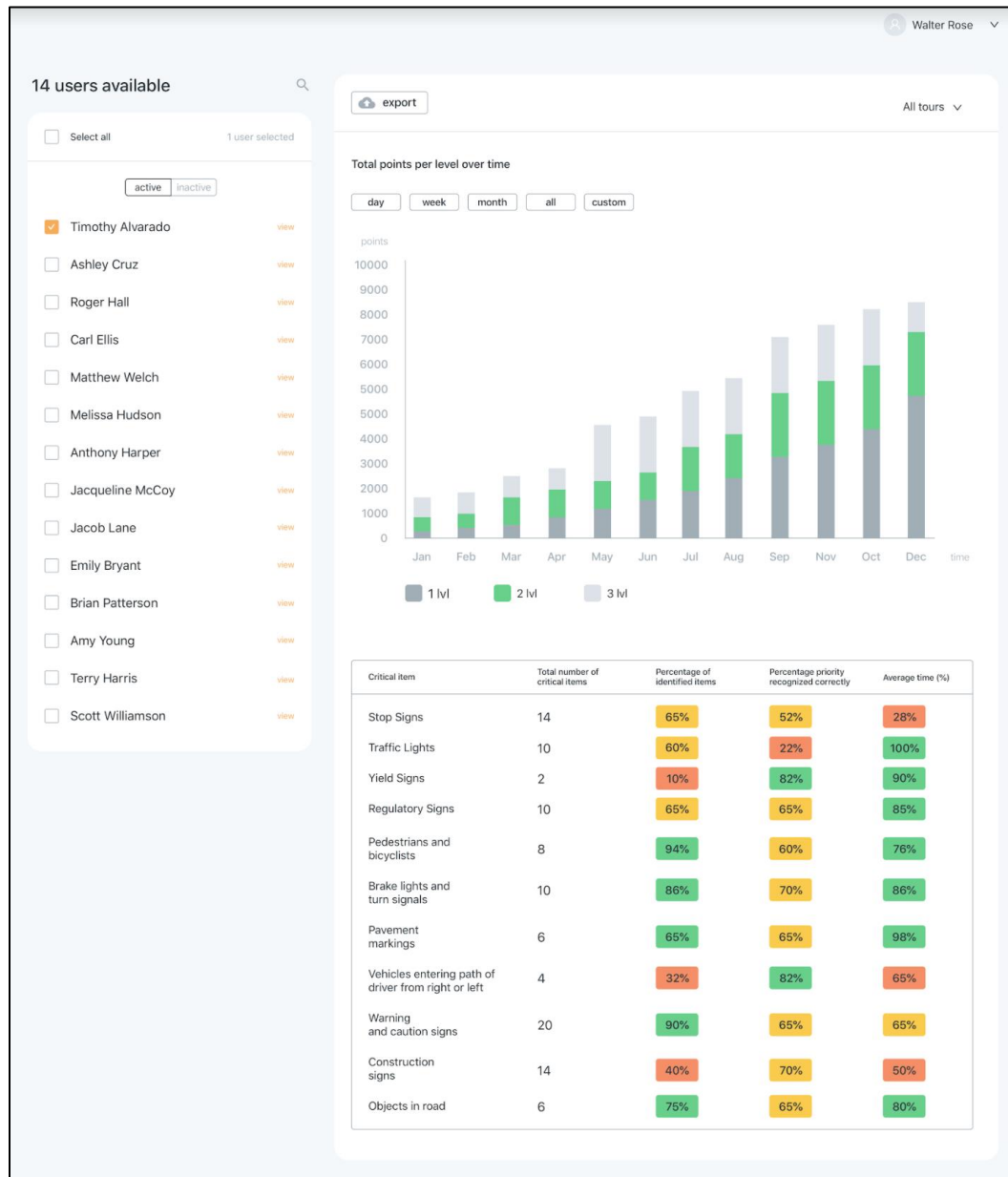
Figure 7. A therapist or instructor can view a client's ability to identify, prioritize, and react to critical information through accessing User Analytics for Drive Focus
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