

Enhancing Learner Confidence and Building Academic Resilience in 15–16-Year-Old Girls Using VARK® Learning Preferences in a Cross-Curricular Classroom

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Abstract

Learning preferences inform how people like to communicate. According to Neil Fleming (2012), the founder of VARK®, learning preferences are reflected in auditory, read/write, kinaesthetic and visual modalities when we take in (input) and share (output) information. Quite often, students are unaware of their preferred inputs and outputs that can make learning not only more enjoyable, but also more effective. This action research project explored how understanding what learning preference modalities are, and how applying specific strategies associated with those modalities can lead to more confident learners and contribute to the development of academic resilience. In a Year 10 elective subject, 15 students used a simple, free, diagnostic tool to explore VARK® learning preference modalities. After exploring the underlying metacognition of VARK® learning preferences, students applied different communication strategies aligned to their preferred modality and then used De Bono's thinking hats as a mechanism to reflect on how their new knowledge and skills had affected them as a learner. Data were collected initially after 4 weeks of learning about the modalities and trialling strategies, and again after 4 months to determine the sustainability and attrition of the new skills and applications. It was found that all students developed improved learner confidence and academic resilience, some because of an increase in self-awareness and others from adding practical tools and strategies into their daily practice. Equally, all students stated they were more confident and independent and developed a more positive mindset about their learning. It is apparent that students who are both aware of their learning preferences and take action to embrace their preferred modalities can, and will, improve their learning experience and thus enhance their confidence. More importantly, they can increase their academic resilience by taking greater responsibility for their own learning and can adjust their communication inputs and outputs to suit their needs.

Glossary

Academic Resilience: the capacity to deal efficiently with study pressure and challenges, reduce learning stress and achieve success despite difficult or challenging educational circumstances.

Academic Self-Efficacy: A student's belief and attitude toward their capabilities to achieve academic success, as well as belief in their ability to fulfill academic tasks

Learning Modality: the sensory channels or pathways through which individuals give, receive, and store information.

Learning Preference: how much a learner prefers certain learning modalities over others.

Learning Style: characteristic cognitive, effective, and psychosocial behaviours that indicate how learners perceive, interact with, and respond to the learning environment.

Metacognition: a higher-order thinking skill that enables understanding, analysis, and control of one's cognitive processes

VARK: an acronym created by Fleming and Bonwell (2019). to represent the four key communication modes of Visual, Aural, Read/Write and Kinaesthetic.

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Measuring, or at the very least, exploring, learning preferences with students is often dismissed as being erroneous or insignificant (Pashler et al., 2008; Felder, n.d.; Nancekivell et al., 2020). This action research project, however, demonstrated how use of a specific learning preferences tool, VARK® ('VARK'), improved girls' learning confidence and self-efficacy, or academic resilience. This research did not seek to simply identify learning preferences (as distinct from learning styles), but rather to assess the impact of an individual knowing what their learning preference is and how this knowledge might improve their learning confidence: in simpler terms, understanding the preferred communication input and output modalities of students, in a learning context, to enable a more positive learning experience and improve self-belief. This research is especially relevant to girls as learners if we consider Kaye, Shipman and Riley's (2022) research, which claims that girls learning confidence "drops by 30% between the ages of 8 and 14" (*Girls' Confidence Plummets Starting at Age 8*, n.d., para. 1).

The value of VARK learning preferences is its specific focus on the learner, rather than the teacher. If students are shown how to use their learning preferences, a stand-alone tool that can identify them and provide suggested strategies and tactics to capitalise on these preferences may be beneficial in building academic resilience. Neil Fleming, the creator of the VARK tool, is cautious in oversimplifying the value of the VARK modalities on students, claiming that, alone, "knowing one's VARK preference for learning is not enough to change study behaviours" (Fleming, 2012, para. 7); change is achieved by students aligning the learning strategies with their preferences. The aim of this action research was, therefore, to explore to what extent learner confidence and academic resilience was enhanced when students explicitly applied strategies that aligned with particular learning preferences.

Research Question

How can an awareness of VARK learning preferences improve girls' learning confidence and build academic resilience?

Literature Review

A common misconception with the term “learning preference” is that it is interchangeable with “learning style.” According to Fleming (2012), VARK is not a learning style in and of itself, more so, it is part of a learning style “about people and their learning” and the modalities that they prefer when learning. Further, there are numerous misconceptions about “learning styles” and a groundswell of belief that they are in fact mythical in their effectiveness, although Nancekivell et al. (2020) remind us that “learning style philosophies are considered myths because they provide anywhere from inadequate to incorrect portrayals of learning” (p. 221). It is important to make the distinction, therefore, that this action research is centred around a specific learning preference tool, VARK, as a mechanism for students to identify specific communication preferences, not as a means to diagnose or pigeonhole them into a specific learner type.

What are VARK Learning Preferences?

VARK is an acronym representing four key communication modes: Visual, Aural, Read/Write and Kinaesthetic (Fleming & Bonwell, 2019). The VARK questions and their resultant “scores” focus on the ways in which people prefer information to come to them (input) and the way(s) in which they prefer to deliver or share their knowledge (output). Valerdi et al (2009, p. 3) define VARK by explaining it “is about our preferences for taking information into the brain and communicating them ‘outside’”. The VARK questionnaire is not a diagnostic tool, but a survey that is designed to give an indication of the preference for particular modalities for the input and output of information (Introduction to VARK | VARK, 2014). It should be noted that the VARK questionnaire is advisory, rather than predictive. VARK modalities have their own “focus, rationale, and strategies” (Valerdi et al., 2009, p. 4). This is an important consideration when using it in the classroom with students. Of even greater importance is the understanding that the VARK modalities are about what the learner does, and not what the teacher does.

Learning Preferences Focus on the Student, not the Teacher

The value of VARK learning preferences is its focus on the learner. Since the 1980s it has been suggested that students' learning and studying in different ways is a pedagogical, or teaching, issue (Hawk & Shah, 2007). Therefore, it is important to consider VARK as a tool that may be beneficial for the student, without expecting that their teachers adopt and accommodate these in every lesson. Having a tool that supports the student become more informed about themselves as a learner, and which requires little more than an open-mind and supportive learning environment from the teacher, is beneficial. Fleming (Introduction to VARK, (2023), para. 7) clarifies that the value of the VARK modalities on students is that "knowing ones' VARK preference for learning is not enough to change study behaviours." In fact, Fleming is adamant that when people make changes to their learning, based on their VARK preferences, their learning will be enhanced (*Introduction to VARK | VARK*, 2014, para. 7). This is achieved by students aligning the learning strategies with their preferences. There is no expectation that teachers should be accommodating for every learning preference combination, although it is acknowledged that when this occurs, the opportunity for students to experience more enjoyment and engagement is increased.

Reliability of VARK as a Tool to Assess Learning Preferences

Fleming's research on VARK modalities began in 1987 and has been accessed by millions of people around the world. In 2020 alone, more than 1.4 million people completed the online questionnaire. It is acknowledged that it is difficult to validate statistically due to several factors, the first being the nature of the questionnaire whereby participants select between zero and all 4 of the options in each of the 16 scenarios. It is important to reiterate that VARK is about preferences, and not strengths.

The VARK questionnaire is not intended to provide strategies to influence how well someone learns, and importantly, it should not be used as a measure of potential academic performance. However, there is evidence that confirms this tool is reliable. In the first instance, self-reporting to the VARK website (approximately one-third of all who use the site) indicates that 74% of people who completed the questionnaire indicated their perceptions matched their preferences for learning, with 23% stating they did not know and just 3% stating it did not match. According to the VARK site, they

consider a “no match” score of 5% or less acceptable. Hawk & Shah (2007) comment that besides Fleming’s own self-reporting of validity and reliability there is little evidence that it is reliable; however, in Fitkov-Norris & Yeghiazarian (2015) completed a pilot validation study of the VARK questionnaire using Rasch Analysis, as distinct from ‘factor analysis’ that had previously been done. Rasch analysis has been used to analyse questionnaires and is most prevalent in assessing from question difficulty to ability of students in multiple choice tests (Fitkov-Norris & Yeghiazarian, 2015, p. 2). This tool sought to determine the rigour of the questionnaire, rather than the statistical analysis of the preference types or combinations. Specifically, Fitkov-Norris & Yeghiazarian (2015, p2) used the Rasch analysis to test the fit of responses in the VARK questionnaire “to a formal scale, which gives the expected responses if an interval scale measurement is to be achieved”. They calculated that the data supports the internal validity of the four sub-constructs of Visual, Auditory, Read/Write and Kinaesthetic and thus could be used as a predictor of learning preference orientation.

Learner Confidence and Academic Resilience

Academic resilience, the ability to effectively manage challenging learning environments and activities and achieve learning success, has never been more important than during, and post, the Covid-19 global pandemic. Students around the world had to learn remotely, via a screen, and, in many instances, without the continuous contact and support of a class or subject teacher. The motivation to learn and work independently was tested and the resulting variation in learner success during this time prompted an exploration into tools and pedagogical approaches that helped students learn. It was my observation that some students thrived with the autonomy and self-direction that was required during online learning, whilst others struggled.

Action Research

In undertaking this action research project, a qualitative approach underpinned by Mertler’s 4-stage action research process (2020) of planning, acting, developing, and reflecting, was followed. More specifically, this investigation was a participatory action research project that aimed to improve the capacity of 15–16-year-old girls and empower them to be more confident learners.

The basic steps and actions of my project are summarized in Table 1.

Table 1

Action Research Methodology in Specific Stages

Planning Stage	Acting Stage	Developing Stage	Reflecting Stage
<ul style="list-style-type: none"> • Literature review to deepen understanding of learning preferences and VARK modalities. • Selecting the group of students and consideration for ethical implications. • Identifying a timeline for data collection. 	<ul style="list-style-type: none"> • Educating the participants on VARK modalities. • Completing the VARK online tool • Plan for the specific actions that enable students to use this data about themselves. 	<ul style="list-style-type: none"> • Review the various activities and complete self-reflections to explicitly recognize the effectiveness of applying the VARK strategies. • Collate students' self-reflections to identify trends, similarities, and anomalies. 	<ul style="list-style-type: none"> • Review the findings and discuss with the students. • Collate the results into summaries in a range of formats. • Review the findings after 3 months to determine retention and sustainability of the learnings. • Construct a research paper outlining the process and findings.

Research Context

Ave Maria College is a Catholic Girls' Secondary school in Aberfeldie, an inner north-western suburb of Melbourne, Australia. The school has an enrolment of approximately 830 students, and 80 teachers. The school has a reputation of slightly above average academic performance, as measured by comparable statistics such as Victorian Certificate of Education (VCE) results and national standardised testing tools such as the National Assessment Program – Literacy and Numeracy (NAPLAN). Broadly speaking, students at Ave Maria College perform at or slightly above, state and national averages in these assessments.

The 15 participants in this action research project were female students aged 15-16 years, in a Year 10 elective subject called CHAOS LAB. This subject is a cross-curricular subject that students complete for one semester. The first unit of work is called "Learning to Learn"; in which students complete a range of metacognition activities and explore the underlying theories and practices of critical and creative thinking.

The Action

As outlined in Table 1, the basic steps of the research action plan were to introduce the concept of VARK to the students, who then completed the VARK online questionnaire. Students then applied different approaches to communication based on the VARK suggestions. After 6 weeks, students used De Bono's *Thinking Hats* (De Bono, 2008) as a reflection tool to analyse what they had learnt and how it had impacted their learning confidence and self-efficacy. Approximately 4 months after completing the "Learning to Learn" unit, students then completed a follow-up questionnaire where they completed two sets of Likert scaled questions and one open-ended question on the experience of learning about VARK learning preferences, how they are using them and the impact that learning about them has had on their learning confidence. Students were also invited to complete one-on-one interviews to provide further details and specific examples of how VARK learning preferences were continuing to impact their learning confidence.

Data Collection

There were three stages of data collection in this research. The first used a quantitative method, whereby students completed the online VARK tool that provided them with scores, up to a maximum of 16, for each of the 4 modalities – Visual, Auditory, Kinaesthetic and Read/Write. These data were analysed in terms of understanding the different learning preferences across the class and were essential for the second data set, where each student completed a self-evaluation on the impact of knowing their learning preference. It should be noted that a comparison of the students' scores was not a feature of this investigation, nor required in the context of the research.

The second data collection point was six weeks after the initial assessment tool was completed. As outlined in Mertler (2020) this data collection point was not done at the expense of teaching, rather it was part of the assessment for the "Learning to Learn" unit of work. In the portfolio of learning, students were required to provide subjective responses to 12 prompt questions, based on De Bono's thinking hats, which provide multiple perspectives on how knowing their learning preferences has impacted them. These classroom artefacts provided first-hand data from the participants. Students were free to provide their reflections in any format, provided they responded to

all 12 questions (see Appendix 1). The questions were open-ended; some required factual, quantitative responses, such as their VARK scores, whilst others required qualitative responses.

To provide objectivity, the questions included prompts for benefits, deficits, feelings and emotions, projections, and barriers. Once submitted, the responses were collated into a single Excel spreadsheet to allow for their comparison and analysis. Through the analysis of these qualitative data themes were identified by identifying consistency in key words or phrases. The analysis of these responses was fundamental to establishing a baseline for the third data set, which determined the residual impact.

The third data collection point was the follow-up questionnaire (see Appendix 2) and one-on-one interviews with students, four months post completion of the “Learning To Learn” unit and assessment task. The interviews were video recorded so they could be analysed objectively, which enabled the validity and integrity of the responses to be protected. They were no more than 10 minutes in duration and centred around three key questions:

- 1) What can the student recall about their learning preferences?
- 2) What, if any, changes have they made to their classroom practice and / or study habits?
- 3) What changes have they noticed in terms of their attitude to learning, approach to learning, and/or improvement in learning outcomes?

Whilst not initially planned for, an additional data collection process of general observations occurred concurrently. An unexpected outcome of exposing students to their VARK learning preferences facilitated ad hoc and unprovoked discussions by the students about changes to their learning habits. Whilst not a part of the formal data collection and analysis, these observations provided a layer of unexpected but revealing data. By engaging in multiple data collection stages, triangulation was possible. This process of integrating multiple sources enabled both a comparison and a validation of the data and, more importantly, enabled the identification of any misconceptions (Mertler, 2020).

Discussion of Findings

1) There Were Initial Benefits and Long-Term Benefits of Using VARK Preferences to Enhance Learner Confidence

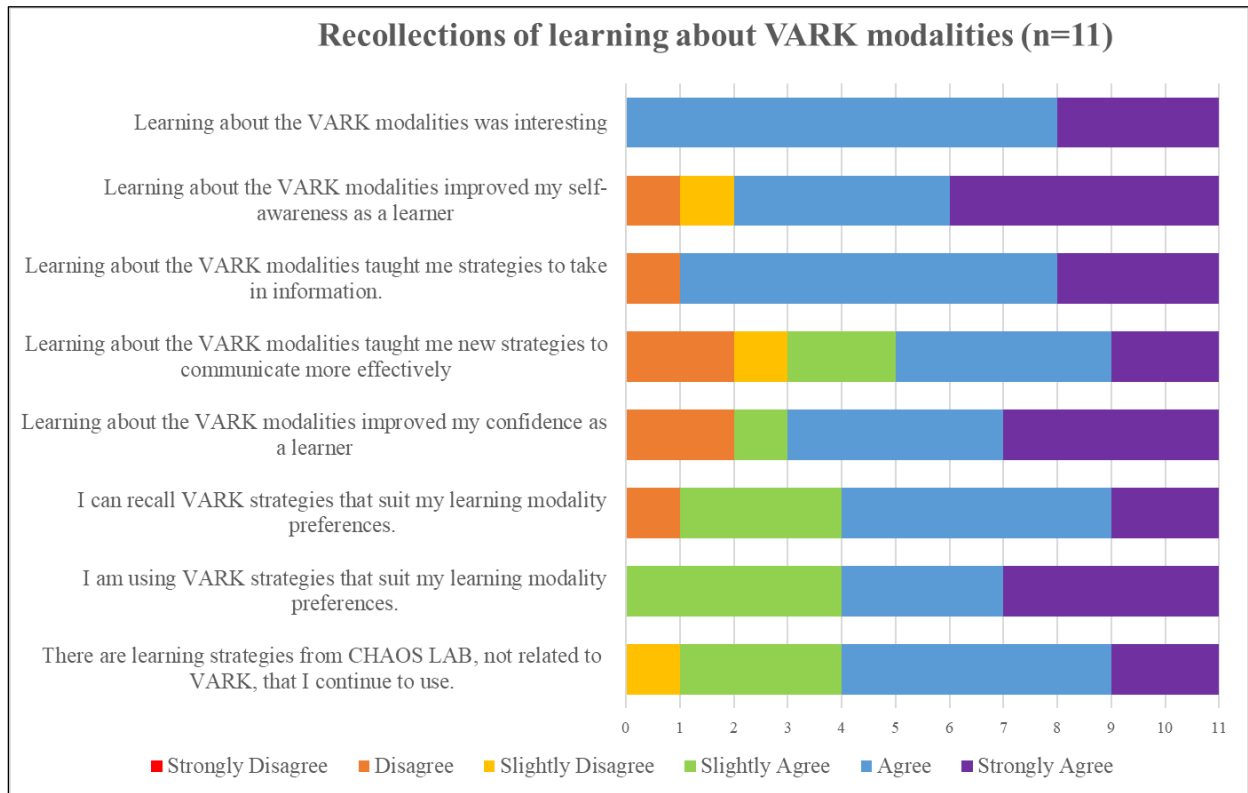
When considering the initial versus long term benefits, student responses to the initial reflection task were compared to their responses in the follow up questionnaire. A key finding was that all 15 students found learning about VARK and learning preferences interesting and valuable. For example:

“Knowing my learning preferences allows me to find out easily how I can learn better, more efficiently and more enjoyable [sic]. I can use my knowledge of my learning preference when I’m revising for a test, to figure out which ways make the information stay in my head the most efficiently, therefore causing me to do better on the tests and in school in general”. (Student A)

Figure 1 shows the range of responses when students were asked to recall learning about the VARK modalities. It is evident that the process of learning about the VARK modalities was interesting for students, with all of them indicating they agreed or strongly agreed with the statement “learning about VARK modalities was interesting”. Likewise, there were only positive responses when asked about specific VARK learning strategies. One student, however, disagreed that learning about the VARK modalities improved her confidence as a learner and two students disagreed and slightly disagreed that learning about the VARK modalities taught new, more effective communication strategies. Four students did not complete the follow-up survey. What is not evident in the graph, is if any students were already aware of their learning strengths, possessed strong learning self-confidence, or already knew and used effective communication tools and strategies.

Figure 1

Stage 3 Survey Responses to Recollection of Learning About VARK

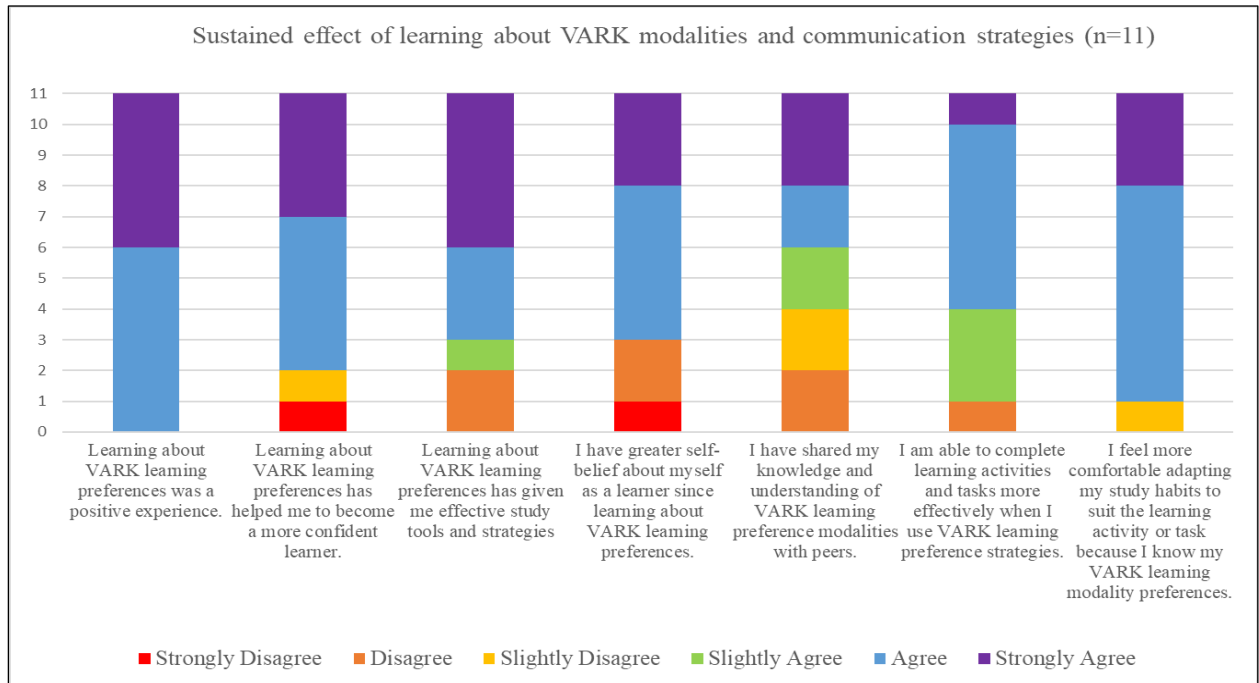


When looking at the sustained impact of students learning about their VARK learning preference modalities, there was a continuation of the mostly positive and beneficial effect. The experience of learning about VARK was positive and, for 9 of the 11 students, it continued to help them be more confident learners. Likewise, 9 of the 11 claimed that learning about VARK provided them with effective study tools and strategies, while 10 of the 11 indicated they were able to complete learning activities more effectively and were more comfortable adapting their study habits to suit the learning activity.

As was the case in Figure 1, the range of “Disagree” comments shown in Figure 2 are primarily from the same two students, with an additional student noting they did not have a greater self-belief in their learning ability despite learning about VARK.

Figure 2

Stage 3 Survey Responses Reflecting on Learnings About VARK Modalities and Communication Strategies



I was conscious of confirmation bias at play here, given students were taught about the potential benefits of knowing their learning preferences prior to completing the task. However, in all of the 11 completed responses, each student was able to identify a benefit with at least one example specific to their experience. In addition, the ability for the students to articulate the benefits in reference to themselves, even if not yet experienced, was evidence of an increasing awareness of themselves as an independent learner capable of success. It is possible that the four who did not complete this question may not have been able to see a benefit and hence did not complete it; however, as they did not complete the task, such a conclusion can't be drawn.

2) Students Experienced Changed Behaviour and Feelings Caused by Exposure to VARK Learning Preference Modalities and Strategies

When students were asked to provide examples of something that made them happy learning about different ways that people take in information, there was a consistent theme of appreciating the

similarities and differences. More importantly, improvement in self-awareness was noted, such as in this response from Student C who commented:

“It’s made me happy to understand why some people do the things they do, because sometimes it would make me frustrated when people would talk while I would be trying to concentrate on writing things, but now I understand that when they talk, they are absorbing the information more. And not everyone is bothered by people talking in the background, I just can’t concentrate because I am auditory and reading/writing preference, so I focus on both and end up not getting anything done”.

Similar comments from other participants were reflected in responses such as, “learning about the different ways that people take in information is that not everyone learns in the same way” (Student A), “there are so many people in the world who learn differently, and those people can find out their learning preference through VARK” (Student B), and, “It’s okay to have different learning preferences from other people. There’s no right learning preference or technique when it comes to learning” (Student C). Some students were explicit in identifying positive benefits, such as student E who said, “I can better understand my strengths and weaknesses; I know what does and doesn’t work. My learning style enables me to do my best,” and Student F, who made an explicit reference to confidence, stating, “I understand how I can be the best and most diligent learner I can be. It limits the time needed for study and increases my confidence in knowing I am capable of being an effective learner.”

Some participants demonstrated increased empathy and understanding of how information about themselves might also have benefits for their peers. For example, Student D commented:

I was excited to learn about how other people learnt so that I could better understand myself and other people's learning styles, as well as the various reasons why people choose to perform each task the way they do. Knowing people's learning styles can help me work better in groups, which is beneficial since it prevents me from being impatient if they want to do a task differently.

When looking at the 11 responses, almost everyone made a connection between themselves and their peers or other learners. Whilst the question prompted them to reflect on what made them happy, it was not a requirement to respond in the context of others. It could be deduced that when learning about themselves as a learner, they became more aware of the learning needs of others, which may have contributed to a more positive and collaborative learning environment.

Some students could identify when a change in thinking disposition would be beneficial and require a change in practice including a range of responses, such as Student F who stated, “when you begin struggling to learn or to find answers it may be a sign that I need to change my thinking disposition.” More comprehensive responses that demonstrate the critical thinking and analysis that students applied can be seen in Table 2.

Table 2

Student Responses to Application of VARK in Peer Settings

STUDENT G	STUDENT H	STUDENT I
<p>“When participating in a group exercise, I would consider thinking in different ways. If everyone in the group has different learning styles, people would approach each task in different ways. This means that in a collaborative setting, I will have to be adaptable in my approach to the work, which means I will have to consider thinking in multiple ways to adapt with the group.</p> <p>When I notice individuals become annoyed or confused by how I or someone else is handling a problem, I will then know I need to adjust my thinking patterns. In group circumstances, I need to keep my mind open and adjust to ensure that everyone understands and can relate to the activity”.</p>	<p>Times when you need to consider thinking in different ways is when you are actively completing tasks that may require different skills to produce new outcomes such as creativity, innovation or logical thinking changing from a creative visual learning approach to an auditory style which would involve discussion and listening may benefit the tasks final production as you are appealing to other aspects.</p> <p>An indicator that a change in thinking disposition is needed is If you try different ideas and don’t seem to be creating the right product or find you are struggling with the task</p>	<p>“A sign that I might need to change my thinking disposition is obviously if the task/assignment requires me to use Visual or Kinaesthetic strategies.</p> <p>Another sign that I may need to change my thinking disposition is if the Aural and Read/Write strategies I am using are not working well.</p> <p>If the strategies that align with my preference are not having a positive outcome, then I will need to change my disposition to help me achieve success or a positive result”.</p>

The responses in Table 2 indicate evidence of increased self-awareness. Several students described physical responses that indicate a change in behaviour or thinking disposition was required, whilst others made explicit reference to thoughts and feelings being indicators for change. Furthermore, in 10 of the 11 responses, students made explicit reference to their learning modalities, which suggests an explicit awareness of their preference and is also recognition that this is not a fixed state.

When determining the level of self-efficacy and independence, it would be fair to say that a student who is able to identify that a particular learning strategy is not working and adapt accordingly and willingly is demonstrating strong learning confidence during what is typically a stressful moment.

3) There Were Barriers to Successfully Applying VARK Learning Preference Modality

Strategies to Improve Learning Confidence and Developing Academic Resilience; But They Were Overcome

“A barrier to me embracing the suggests or actions that reflect my learning preferences is the putting in the effort to make a change to my learning and use some of the suggestions” (Student A)

Knowledge of the VARK learning modalities and communication preferences is not enough to have a positive effect on independence and self-efficacy. To improve learner confidence, students must be able to identify the potential barriers to success and how to overcome these on their own. Students were asked to identify barriers they felt might or had prevented them from embracing the modalities, and their responses included lived examples of their own practices, or “internal barriers.” The question about barriers produced the most diversity in responses, indicating that despite having a systematic approach to identifying and applying effective learning preference strategies, the capacity and motivation to change may be a significant obstacle that needs to be overcome. Examples of the introspective barriers cited included statements such as, “a huge barrier about being a kinesthetics learner is my attention span. I get tired and uninterested in the topic and work” (Student J). Student K identified that for someone with an auditory preference, a potential hurdle in applying the strategy of

voice recording is a dislike of listening to their own voice. Student B identified multiple hurdles of not having enough time to apply the strategy in a classroom setting, and also identified that a lack of support from others might be limiting suggesting that “finding people who want to hear me convey my understanding of a topic can be challenging because people may be uninterested or not have time to listen to me explain all of the content I need to cover.”

Interestingly, Student L noted that a barrier may be that the learning preference itself is a limitation for growth. She implied that by using techniques that work, she may inhibit the natural stretch or discomfort that comes with struggle, which can have benefits for improving learning confidence and adaptability. An inferred barrier for at least one student was a poor grasp of the flexibility of the learning preference strategies. In their response, the student acknowledged that a lack of interest in the topic may be a barrier; however, their qualifying statement suggests that they didn’t realise that they can become interested in topics by using learning strategies that are more suitable to the task. In this example, the student was impeded by their feelings of engagement, rather than a more dominant drive to be a successful learner. It is also worth noting the evidence in Figure 2, where 4 of the 11 respondents had not discussed the VARK modalities and preferences with peers. By not involving others and avoiding discussing it, it is possible that they were less inclined to actively incorporate and practice the strategies.

In addition to explicit barriers, students were asked about what worries they had learning about the VARK learning preferences. The responses can be summarised into 4 key points: being dominant in one or more preferences and those preferences not being appropriate or conducive to the learning environment or task; not being able to learn if the learning preference strategies were not being used by the teacher / peer and not knowing how to discuss or explain that need; thinking that knowing your learning preferences will define you; and teachers may not understand that preference; and being multimodal and not knowing which strategy to use and becoming frustrated knowing that different strategies will work, but it will take time to figure out which one is best in a given situation. Further, an unexpected result was identified by Student D, who commented that she worried, upon reflection, how not knowing her learning preference previously may have impacted her.

The possibilities of still not being understood or not having a learning environment that reflects or provides opportunities for different learning preferences and communication strategies is a genuine concern expressed by several students, however, there are two important points to note. Firstly, the theory of VARK has never suggested that a teacher needs to “teach to VARK.” In fact, Fleming is quite vocal in stating that “when people make changes to their learning, based on their VARK preferences, their learning will be enhanced. They do this by using strategies that align with their preferences” (VARK FAQ – Authoritative Answers to All Your Questions, 2014, l. 25) Secondly, this research was focused on how knowing the VARK preference can empower students and, most importantly, how they can adopt and adapt their learning practice in response to the learning conditions. A true measure of self-efficacy and independent, confident learners is their ability to identify when success is waning and amend their own practice and behaviour accordingly.

Conclusions

In exploring whether an awareness of VARK learning preferences improved learning confidence and built academic resilience, it is important to note that any measure of confidence is not easily quantified and is subject to learning experiences and environments which are dynamic and constantly changing. That said, all participants in this study expressed positive responses to learning about the VARK preferences and modalities and could recognize that this knowledge improved their understanding of themselves as a learner as well as how others learn, or, more specifically, take in and express information. The benefit of the VARK tool (score) indicating the relationship of the different modalities provided sufficient flexibility for students to apply various strategies in different applications, highlighting that the VARK tool is accessible and applicable to all students.

The long-term benefits of VARK and measure of academic resilience is more challenging and would require further feedback more akin to a longitudinal study; however, in relative terms, the fact that all participants were continuing to use VARK strategies aligned to their learning preference modalities more than four months after initially being exposed to them would suggest that this is a favourable tool that has potential to have long lasting benefits for a student’s learning success.

Reflection

Participating in the Global Action Research Collaborative has been an engaging and rewarding program, not only because of the opportunity to complete this action research project but also because of the wonderful connections made with educators around the world. I acknowledge the support of my research advisor, Debbie Hill, who was very accommodating and supportive throughout all stages of the program. To “Team Hill,” thank you for the wonderful discussions, sharing of ideas and feedback, and in particular Gemma for your sage advice, unwavering enthusiasm and genuine interest in my topic.

In terms of the research, I am so pleased to have been able to complete this investigation on a topic that has been a passion for several years. To formalize my classroom practice to try to document the value of VARK for students and the learning environment was both challenging and rewarding. Being able to move from ad-hoc, anecdotal evidence into a more formal process of explicit data collection and analysis has been an exciting and rewarding achievement. I have been using the VARK tool for many years and have had endless numbers of former students comment to me about how it has changed them as a learner, so being able to document this and share this with other educators is a goal fulfilled.

I would like to take the opportunity to thank my Principal, Ms Tanya Hutton, for supporting my application to be a GARC fellow and allowing me to participate in the program. I would like to thank my colleagues at Ave Maria College who indulge me whenever I want to talk about VARK Learning preferences and the ways in which it can benefit our students in building their learning confidence. The discussion around VARK and learning preferences has become more common throughout my school and I am excited to see how this might continue to grow, be applied, and have more wide-ranging benefits for our students.

I would like to thank and acknowledge all of my current and former students, not only those in my CHAOS LAB elective, but also other classes where we have explored VARK. The students who were the subject of this project were so willing to be involved and their contributions to the different activities, assessments and data collection points ensured there were both useful and sufficient data. In equal measure, I thank all of my previous CHAOS LAB students who have

undertaken different iterations of this project which helped me to refine and develop when and how this is taught. Each group of students over the past three years has provided me with feedback about what works and what doesn't when learning about VARK and applying the different strategies. Their contributions enabled me to develop a robust unit of work, with a range of activities and opportunities for feedback. I hope that they continue to grow their learning confidence.

I would like to thank the VARK organisation for granting me permission to use their questionnaire for this action research project.

Finally, I would also like to thank my family and friends, particularly my sister and my mum. I dedicate this paper to my mum, Frances, who passed away during the project. I wish she were here to proofread the final report but thank my sister for taking on the task. I know that my mum was immensely proud of me and would be thrilled that I have completed this research (and my sister is too). I am eternally grateful to my friends who not only support my academic endeavours, but who also share what I do with others. To know that what I am doing has impacted others in positive ways is a lovely reminder of the joy that teaching provides and reward for the investment I make in my students' learning.

References

- De Bono, E. (2008). *Six thinking hats* (Rev. and updated ed). Penguin.
- Felder, R. M. (n.d.). *OPINION: USES, MISUSES, AND VALIDITY OF LEARNING STYLES*. 14.
- Fitkov-Norris, E. D., & Yeghiazarian, A. (2015). Validation of VARK learning modalities questionnaire using Rasch analysis. *Journal of Physics: Conference Series*, 588, 012048. <https://doi.org/10.1088/1742-6596/588/1/012048>
- Fleming, N. D. (2012). *Facts, Fallacies and Myths: VARK and*. 3.
- Girls' Confidence Plummets Starting at Age 8: Here's How to Keep Her Confidence Strong*. (n.d.). Kwww.Amightygirl.Com. Retrieved 5 June 2023, from <http://www.amightygirl.com/blog?p=27408>
- Introduction to VARK | VARK*. (2014). <https://vark-learn.com/introduction-to-vark/>
- Nancekivell, S. E., Shah, P., & Gelman, S. A. (2020). Maybe they're born with it, or maybe it's experience: Toward a deeper understanding of the learning style myth. *Journal of Educational Psychology*, 112, 221–235. <https://doi.org/10.1037/edu0000366>
- Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning Styles: Concepts and Evidence. *Psychological Science in the Public Interest*, 9(3), Article 3. <https://doi.org/10.1111/j.1539-6053.2009.01038.x>
- Valerdi, R., Ferris, T., Jain, R., & Kasser, J. (2009). 10.1.1 An Exploration of Matching Teaching to the Learning Preferences of Systems Engineering Graduate Students. *INCOSE International Symposium*, 19(1), 1439–1456. <https://doi.org/10.1002/j.2334-5837.2009.tb01025.x>
- VARK FAQ – Authoritative answers to all your questions*. (2014, July 30). <https://vark-learn.com/introduction-to-vark/frequently-asked-questions/>

Permission to use VARK

Permission to use the VARK tool and associated materials for this research was granted on 28/6/2022 © Copyright Version 8.01 (2019) held by VARK Learn Limited, Christchurch, New Zealand.

Appendices

Appendix 1

Learning to Learn – Self-Reflection Questions

<p>White Hat:</p> <p><i>The White Hat calls for information known or needed. “The facts, just the facts.”</i></p> <p>What scores did you get for the different Learning Preferences tests?</p> <p>How can you account for the similarities and differences in the results from other tests?</p>
<p>Yellow Hat:</p> <p><i>symbolizes brightness and optimism; explore the positives and probe for value and benefit.</i></p> <p>What are the benefits of knowing your Learning Preferences?</p> <p>Which specific action/s aligned to your learning preference do you mostly strongly relate to?</p>
<p>The Black Hat</p> <p><i>Is judgment – the devil’s advocate or why something may not work. Identify difficulties and dangers, where things may go wrong. The most powerful of the Hats but a problem if overused.</i></p> <p>What has been confusing or worrying about discovering your learning preferences?</p> <p>What is a barrier to you embracing the suggested actions or activities that reflect your learning preferences?</p>
<p>The Red Hat</p> <p><i>Signifies feelings, hunches, and intuition. When using this hat, you can express emotions and feelings and share fears, likes, dislikes, loves, and hates</i></p> <p>How do you feel about your learning preferences scores?</p> <p>What is something that has made you happy in learning about different ways that people take in information?</p>
<p>The Green Hat</p> <p><i>focuses on creativity, the possibilities, alternatives, and new ideas. It is an opportunity to express new concepts and new perceptions.</i></p> <p>What are some of the ways your learning preferences have been used or applied already?</p> <p>How do your free writing task/s reflect your learning preferences?</p>
<p>The Blue Hat</p> <p><i>used to manage the thinking process. It is the control mechanism that ensures the Six Thinking Hats® guidelines are observed.</i></p> <p>When might you need to consider thinking in different ways?</p> <p>What might be some of the signs that you need to change your thinking disposition?</p>

Appendix 2

Follow-Up Questionnaire

4. Thinking about each of the following statements, please indicate how strongly you agree or disagree *

	Strongly DISAGREE	Disagree	Slightly Disagree	Slightly AGREE	Agree	Strongly AGREE
Learning about the VARK modalities was interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning about the VARK modalities improved my self-awareness as a learner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning about the VARK modalities taught me strategies to take in information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning about the VARK modalities taught me new strategies to communicate more effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning about the VARK modalities improved my confidence as a learner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Thinking about each of the following statements, please indicate how strongly you agree or disagree *

	Strongly DISAGREE	Disagree	Slightly Disagree	Slightly AGREE	Agree	Strongly AGREE
I can recall VARK strategies that suit my learning modality preferences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am using VARK strategies that suit my learning modality preferences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are learning strategies that I learnt in CHAOS LAB, not related to VARK, that I continue to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Please outline a favourite VARK strategy that you continue to use today. *

VARK learning preferences and self-efficacy

7. Thinking about each of the following statements, please indicate how strongly you agree or disagree *

	Strongly DISAGREE	Disagree	Slightly Disagree	Slightly AGREE	Agree	Strongly AGREE
Learning about VARK learning preferences was a positive experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning about VARK learning preferences has helped me to become a more confident learner.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning about VARK learning preferences has given me effective study tools and strategies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have greater self-belief about myself as a learner since learning about VARK learning preferences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I have shared my knowledge and understanding of VARK learning preference modalities with peers.

☐ ☐ ☐ ☐ ☐ ☐

I am able to complete learning activities and tasks more effectively when I use VARK learning preference strategies.

☐ ☐ ☐ ☐ ☐ ☐

I feel more comfortable adapting my study habits to suit the learning activity or task because I know my VARK learning modality preferences.

☐ ☐ ☐ ☐ ☐ ☐

8. Feel free to make any general comments or statements about the impact that learning about VARK learning preference modalities has had on your confidence, capacity, efficiency and effectiveness as a student. *