PEER REVIEWED ARTICLE
Beyond Temporary Experts: Secondary Students' Experiences in Autonomous Research

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ABSTRACT

This qualitative case study explores the experiences of students in their final year of the International Baccalaureate as they prepared, researched, and completed their Extended Essay project - an autonomous research process which develops their capacity to analyse, synthesise and evaluate knowledge. The study's aim was to understand how this autonomous research approach contributed to their overall research experience which may be grounded in the af-

fective and cognitive domains. Using *thematic analysis*, data were analysed from the interview responses of 85 students who graduated from a Queensland State School in 2017. The students were asked a series of questions about aspects they enjoyed, or found rewarding, and aspects they found challenging during their independent research.

The findings resulted in detailed accounts of their information use experiences described under the overarching themes of:

- enjoyment,
- rewards, and
- challenges.

The study also questioned whether students, who exert such a level of expertise in their research, should happily settle for the achievement of *temporary expert*. It questioned if educators could be more proactive in moving students beyond temporary and/ or marginalised information use experiences, to becoming expert users of information?

GLOSSARY

Autonomous – independent and self-directed.

Advanced Placement students – American high school students who study college level curricula and sit these exams to receive credit at university.

Extended Essay (EE) – a compulsory research project for students in their final year of their International Baccalaureate (IB).

Relational approach – considers the relationship between users and information.

Temporary Expert – a term coined by one of the participants in this study, meaning after completing their EE they felt proficient and experienced on their topic, however it was impermanent.

Thematic Analysis – a methodology identifying common themes (i.e. familiarisation, coding, generating themes, reviewing themes, defining and naming themes, and writing up).

Viva Voce – This is an interview conducted after the EE. It allows students to celebrate success, talk through challenges and reflect upon their learnings on research.

INTRODUCTION

The focus of this case study was students' research experiences around the Extended Essay (EE), which is completed in the final year of the International Baccalaureate (IB) Diploma Program. A series of questions was asked at the Viva Voce interview. These interviews helped the researcher and the teachers involved better understand the experiences of these young people who used a variety of information for research purposes and writing an EE. The research adopted a qualitative approach using thematic analysis methodology (Braun & Clark, 2013). There were a number of themes and subthemes identified which revealed insights into students as researchers; or, as one student described themself, *"a temporary expert".* This paper will provide the background to the study, then discuss the data that emerged thematically. Finally, it will explore the implications of the findings and how new understandings about students' experience of autonomous inquiry might enable teachers to better support students to become temporary experts in research.

BACKGROUND

The research was undertaken at a Queensland State School with Year 12 students who graduated in 2017. The total year level cohort was 85 co-ed students, attending a selective entry school. The EE is a requirement of the IB curriculum. Students work on their EE along with prescribed assessment for six other subjects, including a 2000-word Theory of Knowledge Essay. The EE is a culmination of the students' abilities to investigate a topic within a subject they have enjoyed, or have had academic success, through extended research inquiry. The underlying principle is that IB students have harnessed and developed discipline specific research skills from the various subjects they have studied in the two year Diploma Program. Therefore, the EE is independent and student focused.

A teacher supervisor acts as a guide and must validate that students' research is entirely their own. Students have three mandatory meetings with their supervisors but may meet for clarification at any time. The mandatory meetings cover such milestones as setting the topic and inquiry question, the research proposal and discussion of draft submission. The final meeting is the Viva Voce where students are asked a variety of questions about their affective and cognitive experiences in their research inquiry process. The EE Coordinator provides support through workshops; and the library staff support research through resourcing and referencing.

LITERATURE REVIEW

The Literature Review for this study focused on research experiences of students in senior secondary school who had conducted independent, sustained research. The literature found that undergraduate university students generally have greater experience of research than secondary high school students. Also highlighted were the ethics involved in working with young people in research and the marginalisation that sometimes occurs when the student voice is not foregrounded.

ENCOURAGE STUDENT VOICE

The general literature on young people as researchers contextualises them as 'co-researchers' (Honkanen, et al., 2018). That is, educators preferred to *lead* the research with students taking an assistant role. The research discusses the ethical constraints and the training involved for students to become research ready (Schafer & Yarwood, 2008; Bradbury-Jones & Taylor, 2015), based on an assumption that students have very limited research experience and need highly structured support. Educators suggested that it is usually a laboured process to equip students to conduct research work.

However, Schafer and Yarwood (2008) describe the outcome as having "the potential to acknowledge and highlight young people's agency" (p.12) in contributing to research design. Therefore, working towards developing young people as independent researchers leads to successful student outcomes. Yet, adolescents are often marginalised when it comes to contributing their voice to research, especially in matters which impact on them directly (Bland & Atweh, 2007; Schafer & Yarwood, 2008; Bradbury-Jones & Taylor, 2015).

Other research completed concerning young students as *scientific researchers,* explored the feelings of excitement and frustration when grappling with scientific research. Jaber and Hamer (2016) noted that the binary feelings of excitement and frustration during research contributed equally to engagement. These findings are important to consider in light of growth mindset opportunities, and coaching conversations around research experiences with students.

Researchers are still coming to an understanding about whether higher achieving students are better suited to inquiry-based research, adopting a research mind-set more readily than students achieving lower grades (Hughes, 2018). However, Cianfrani et al. (2020) understand the importance of providing research experience to students who do not necessarily fit the high achievement status. They offered opportunities to students of varying levels of academic experience to conduct autonomous scientific research. They learned that "students learned how much creativity, flexibility, and patience scientific research requires and experienced the fun and sense of wonder the process can instill" (Cianfrani et al., 2020, p.63).

DEVELOP ENTHUSIASM FOR INDEPENDENT RESEARCH

Some researchers argued that learning specific information and research skills aided enthusiasm for research. Work exploring Argument Driven Inquiry (ADI) suggested that intrinsic enthusiasm is not enough (Walker & Sampson, 2013). ADI involves using peer reviews to revise and edit, which requires knowledge and expertise. The research team attributed the acquisition of skills to student engagement as a result of teaching scientific writing (Walker & Sampson, 2013). Kelly (2017) suggested that a lack of skills can contribute to a lack of confidence or self-efficacy when embarking on research. This is concerning if educators take the view, raised by Schafer and Yarwood (2008), that adolescent students are under skilled in research. However, evidence suggests that some research skills are difficult to attain and develop, thus providing challenges and a block to progress in learning (Hughes, 2018). If a deficit in research skills is apparent, or even perceived, this could contrib-

ute to a lack of motivation for student-led research. Thus, involving peers, as well as teachers, to provide *intentional feedback* could be a factor in student research engagement.

COGNITIVE OVERLOAD

Frustration, for students, can be a challenge when reading research articles. Articles containing high level information and dense data can be cognitively overloading, thus leading to a decrease in research motivation (K.N. Howard et al., 2021). Acknowledging the level of concentration required to evaluate articles and assessing whether they align with the intended research, as well as understanding the energy drain from lengthy search sessions, are legitimate considerations (Kelly, 2017). A very recent Australian study strongly suggested educators rethink inquiry-based learning in favor of a more teacher focused pedagogy due to the harmful cognitive overload experienced when encountering new information (Sweller, 2021).

Further frustration may occur when students are engaging in threshold concepts or troublesome knowledge (Meyer et al., 2010; Akerlind et al., 2011). Students who find themselves cognitively overloaded, may struggle with self-regulation, unaware of the impact of metacognition (feelings, judgement, experiences) during the liminal state of threshold learning (Land et al., 2005; Efklides, 2005). Kuhlthau's (1991) *Information Search Process* (ISP) model examined information behaviour acknowledging moments of uncertainty, frustration, achievement, and fulfillment exist in the course of the research, and the importance of managing that. It creates consciousness of a range of positive and negative experiences and the emerging behaviour associated with them. The model raises awareness and acceptance to embrace these as part of the research journey.

Discovery and autonomy are influencers in engagement. The discovery experience has been noted as important when engaging students in research (Vander-Maas-Peeler et al., 2015). Autonomy over one's learning has also been cited as pivotal in engaging students in their research (McCombs, 1991; Ryan & Deci, 2000; Gasiewski, et al., 2011). Thus, it would appear

that autonomy plus discovery propels student engagement and enrichment in learning when conducting research. Mihaly Csikszentmihalyi (2013), known for his work around the psychology of happiness, stated, "knowledge that is seen to be controlled from the outside is acquired with reluctance and it brings no joy" (p.134). This quote, grounded in psychology, suggests that students working autonomously may tap into their affective domain whilst constructing knowledge, and experience joy.

Focusing on student research within the EE context, self-efficacy and engagement were investigated in a study to explore the benefits of the IB curriculum for university studies in America (Inkelas et al., 2012). Students were asked about their experiences in terms of engagement and excitement in their research. The study found that students who completed EE as part of the IB curriculum, were likely "to find their research experiences interesting, be proud of their research projects, and be satisfied with their research experiences" (p.24) compared to Advanced Placement students (students who study college level curricula and sit these exams to receive credit at university). Of interest was that the excitement of discovery these participants experienced, *did not* extend into seeking further research despite the acknowledgement that research opportunities were anticipated in their future professions.

In summary, the research discussed in this literature review indicates the value of engaging young people in autonomous research. Where curiosity propels the research, it means that students are encountering discoveries, struggling with threshold learning, maintaining independence, and developing research skills. Their perseverance in this process will yield desirable diverse outcomes. However, there is still limited research that explores how students themselves experience the autonomous inquiry process. This study set out to address this research gap.

THE RESEARCH APPROACH

This research was conducted from a relational perspective (Bruce, 1997). It sought to understand the relationship between the user of information and the ways in which information is used to extend learning about a topic. A qualitative approach allowed meanings to be constructed whilst seeking to understand the experiences of students using information in the real-life context of their secondary school and the EE requirement of the IB curriculum (Creswell, 2009). More specifically, it explored the phenomenon of senior students' experience of using information to research a topic and develop an inquiry within an area of interest connected to senior curriculum. Meaningful information was collected by constructing broad, open-ended questions in this single case study of 85 co-ed students. The questions allowed participants to construct meaning and insight into their learnings of their research experience. The documented responses reveal how students designed their research inquiry: deciding on a topic, designing a research question, finding appropriate articles to support their own research and writing the body of work.

Twenty-minute interviews (Viva Voces) were conducted where students described their experiences with the EE. The supervisory teachers, including myself, interviewed their students using a standard set of established questions:

- What did you enjoy the most?
- What did you find most rewarding from completing the Extended Essay?
- What were the challenges around the research?
- How has this prepared you for university?

The interviews were recorded using Audacity software and stored in the school-hosted Microsoft OneDrive folder. Each interview was transcribed and then coded. Insights into themes and subthemes were generated deductively and were grouped accordingly. I undertook an iterative reading process of the transcripts and always considered the data. A coding frame was created which involved generating succinct labels that identified important features of the data relevant. The coding frame was based upon the phrases generated from the questions. As a result, I was searching for experiences related to *enjoyment, rewards, challenges* and *future research and/or university*.

After coding, I examined the data for patterns, which resulted in the final themes - *enjoyment, rewards, challenges*. These were checked against the dataset to determine that they tell a convincing story of the data and were ones that answered the set interview questions. Next a detailed analysis of each theme was developed, working out the scope and focus of each theme, determining the 'story' of each. This final phase incorporated weaving together the analytic narrative and data extracts and contextualising the analysis in relation to existing literature.

The methodology used to explore the data was the thematic approach (Braun & Clark, 2013). Here, themes are defined as a pattern of shared meaning underpinned by a central concept or idea. As previously outlined, the themes were related to student experiences around researching and writing the EE and were identified inductively. This means that the themes are strongly linked to the data and emerge regardless of the researcher's theoretical stance (Braun & Clark, 2013). Through this inductive approach, three major themes were finalised – enjoyment, rewards and challenges.

FINDINGS
Students were asked what they enjoyed most about producing the EE. Four subthemes were generated:

- pursuing information,
- information exploration,
- encountering information, and
- valuing information.

PURSUING INFORMATION
Students maintained that part of the enjoyment of the research process was in pursuing information. Many students had not previously used scholarly journals and articles as comprehensively prior to completing the EE. Participant A, noted that, "breaking down [the information] in the online articles [was enjoyable] I was getting one step closer to answering question, this process increased my knowledge".

As students followed very focussed topics, the information they drew from provided the capacity to gain a discerning understanding of their topic.

Other students commented that, in the pursuit of information, "collating data was really interesting" (participant B) and "learning new and interesting aspects about the topic" (participant C) was part of the enjoyment process for them. However, a comment provided by participant D regarding a sense of wonderment in the pursuit of information, also pinpointed a sense of purpose, "being able to become a temporary expert in that area, being able to talk to family and friends knowledgeably in this aspect". This student, empowered by the detail of the research they were engaging with, felt like "a temporary expert".

INFORMATION EXPLORATION
A further sense of enjoyment was experienced through the subtheme of information exploration. Students were aware of the freedom to "explore more", as participant E claimed. Students observed that there was more freedom associated with an EE as the parameters were broad and the inquiry question was not designed and disseminated by an external examining board. The student created the inquiry, inclusive of the title, topic and question, allowing independence. Participant F commented, "I was fascinated by my topic. When I researched, I realised I had fifty-nine tabs open [on the laptop]. I really enjoyed finding out about my topic".

Becoming caught up in the *fascination* of the topic was a common thread for many students. This is called being in 'the flow' when using information. It is characterised by the experiences of being in control of one's research, feeling more confident in one's research abilities and more positive in the way one approaches components of the research task (Weston, 2018).

Furthermore, students felt that they were able to delve deeply into the research. This caused a sense of enjoyment around the information seeking process. Students found that they were, "able to delve really deeply into one topic, reflect and understand one topic…"(participant G) and "in class, we don't get the chance to dig as deep" (participant H). The EE can take up to a year to complete, but this time frame allows the experience of giving more time to the phases of research, in particular exploring information.

ENCOUNTERING NEW INFORMATION

Encountering new information was another important subtheme under enjoyment. This experience is linked to discovering new information or encountering information for the first time. For example, students found that "stumbling across something new was exciting" (participant E). This in turn motivated them as the experience of encountering new information felt "pioneering and interesting" (participant I). Many students knew theories and frameworks that had been taught in class but finding new information that supported these theories was also a source of excitement. As well, many students had not used online databases before and the experience of using these, and the parameter tools that allow them to refine their information searches, was meaningful.

VALUED INFORMATION

Producing valued information links to the independence experienced in this assessment task. When using information to complete this task, Participant J stated, "I learned a lot more that I didn't know before. Other people wanted to read my EE. I felt like I was doing something people valued".

Personal learning was valued as well as the added knowledge acquired because others were interested in what they had learned. Students felt they were learning how to unpack information and construct knowledge through the acquired understanding of the articles they read. Participant K commented, "Each time I broke down an article, I felt I was getting one step closer to answering the question". Furthermore, students were able to build on personal engagement. As participant L noted, topics were "chosen for personal reasons. I really wanted to find out more about this [my topic]".

REWARDS

Students were then asked what they found most rewarding about completing an EE. The emerging subthemes were:

- accomplishment,
- 'real' research,
- writing,
- real-life applications
- analysis, and

- knowledge and understanding.

ACCOMPLISHMENT

The student participants expressed a certain sense of accomplishment after completing 4000 words of research. Students commented that "knowing you have done that hard work, I feel proud" (participant M). Many felt that this was the best work they had accomplished whilst simultaneously feeling relieved.

'REAL' RESEARCH

Skills were acquired or refined during the process of this research. Of interest were the experiences involved around the quality of information found. Participant D felt that after sifting through information they began to be able to "tell what a good resource was and what wasn't". Participant N stated, this research was

> intensive [and] I prefer to read line by line, so take notes [which] builds for a better essay and you are more relaxed and more conscious of what you are writing, and you have editing time left. Editing time is required and you don't want to rush this.

Many felt their referencing improved, as suggested by participant O who now felt they knew "how to write an essay without clear guidelines which is what I think it will be like in Uni".

WRITING

The EE is an academic program which requires students to analyse, demonstrate critical thinking, synthesise, summarise and make recommendations based on their evaluations. This is a challenging undertaking and students are tested as they aim to achieve the 4000-word count. Nevertheless, according to the interview data, the writing process was rewarding. The achievement of meeting the word count goal, and the depth of writing associated with that, was acknowledged. Added to this was the belief that undertaking this formal writing exercise had positive effects on other IB subjects requiring similar writing styles.

ANALYSIS

Rewarding experiences were gained through analysing. Students expressed that, they worked on developing analytical skills in order to access journal articles. More specifically, students addressed the fact that they gained an understanding of how to analyse more deeply because of the quality of the scholarly work they were reviewing. Furthermore, students continued to comment that they were becoming more familiar with how to find "good resources" (participant D). A direct benefit was that students were able to apply their emerging analysis skills to other subject areas. Students commented that their overall marks in Psychology and English improved because of completing their EE.

KNOWLEDGE AND UNDERSTANDING

Students gained knowledge and understanding and found this rewarding. Not only were they broadening and increasing their personal knowledge, but they were also sharing this knowledge with others. Participant P stated that it was "rewarding to share [her] EE knowledge with [her] mum". Others claimed that they gained new perspectives and, once realizing how much knowledge they had gained, they felt proud of the understandings developed around that knowledge. Students felt that they could incorporate their knowledge and understanding into other classwork and assessment. They felt they could transfer their developing skills, knowledge and understandings into the context of further study, most likely university.

CHALLENGES

Students were asked about the challenges associated with producing an EE. The following subthemes were produced:

- time management,
- defining,
- the writing process, and
- collecting information.

TIME MANAGEMENT

Students experienced challenges around time management. The challenge of starting the research, physical and mental demands and be-ing organised were cited as the main barriers to being effective at managing the time to complete their EE. Students can spend well over the recommended time if not managed effectively. Students struggled with how to begin. Some commented that they left it too long before they made a start, which resulted in a rushed production. Juggling the essay against other subject commitments was difficult for some. Finally, the fatigue from concentration was challenging and for some stressful.

DEFINING

Choosing a topic and constructing a research question was another challenge for some students. Some students felt that finding a "viable topic" (participant Q) was formidable. Students recognized that at times they were unrealistic with their choices. Students also found that their readings sometimes opened up many research possibilities, and as a result "refining the research question was tricky" (participant R).

THE WRITING PROCESS

Word limit, being concise, structuring the essay, proofreading and responding to edits all contributed to the challenging experience felt by some students in this cohort. Some participants found *"stream-lining ideas"* and *"condensing"* information was demanding in the process of synthesising content. Coherency, flow and polishing up their writing were also important to students. The tasks of proofreading and editing were described as challenging; however, students understood the value of this important work.

COLLECTING INFORMATION

Sourcing data (Science students), appropriate information and making decisions around information were the top challenges when collecting information. As students were creating research questions that required a variety of information sources to answer the investigation, finding the information to guide their inquiry proved to be demanding at times. Some students felt they required industry information, primary data, and confidential financial information that were not always available through school-based databases. Added to this, many students were

able to find the body of information but found it difficult determining what was relevant to their research. Furthermore, students did try to problem solve the issues of not being able to "find enough content" (participant S). Often, students had to adjust their research topic to adapt to *perceived* lack of information. Research questions were also adjusted in response to the information that was available.

DISCUSSION AND CONCLUSION

Autonomy in research brought forth positive experiences for this student cohort. Schafer and Yarwood's (2008) research involved young people as interviewers with their peers in order to value adolescent perspectives on social disadvantage. In the role of interviewer, their input was encouraged and valued, rather than marginalised. The student experiences in this case study on the EE endorsed these findings. Students' research was acknowledged externally by others in authentic situations. As a result, the overarching themes of enjoyment and rewards from research were identified. More specifically, because their contributions were not marginalised, students shared their newly acquired knowledge with friends, family members and in many cases, people in the industry areas of their research. Students' confidence in the knowledge and understanding built around their area of research was recognised in other classwork and assessment.

Our *temporary experts* felt that they could communicate enthusiastically about their research. This was due to students being able to explore more deeply. Developing their own inquiry, often based on personal curiosity, or finding themselves in need of solving a real-life problem, contributed to the authenticity of their research. The rewards were tangible and constructive. The knowledge and understanding gained was generally shared enthusiastically and transferred effortlessly.

RESEARCH READY

Students emerge from the EE *research ready*. This is a desirable trait for universities enrolling undergraduates. These students described the valuable cumulative experiences of delving deeply into topics, discerning useful infor-

mation, honing analysis skills, improving referencing, and familiarising themselves with databases. Unlike the students in the Inkelas et. al (2012) study, many of these students, when asked about the possibility of utilising the skills gained from this experience at university, readily agreed that they would be looking to build on their growing research expertise. Therefore, providing research rich opportunities for students as early as possible would contribute to extending their *research ready* experience.

GROWING CONFIDENCE

Developing further or more extended research skills may not be the only outcome of engaging with research. This research concluded that discovery and curiosity were intrinsic elements to enjoying and rewarding research. The students agreed that their ability to identify *good* research along with a growing confidence in finding *good* research articles made reading personally valuable. De Naeghel et a.l (2012), claimed, "Reading out of curiosity makes reading personally valuable" (p. 1016). Stumbling upon new information, due to curiosity whilst immersed in using information, was valued. These experiences can be continued by creating opportunities for students to be genuinely curious during inquiry research.

Interestingly, not all experiences around research were rewarding or enjoyable. This case study showed there were significant challenges for students. Frustration with the research experience is a common thread in the theme of Challenge. As noted in the research by Howard et al. (2021) and Kelly (2017), experiencing frustration when engaged in independent research can be due to cognitive overload. Students confirmed this in their interview discussions, commenting that fatigue from concentrating was a real issue. Information overload also occurred when the information found presented endless possibilities for research topics. Confirming inquiry topics was also a cause of aggravation for some. The writing process placed cognitive demands on students engaging deeply with information. More specifically, synthesising the information became extensive work for many. Manipulating, consolidating concepts, and communicating them through the writing pro-

cess, was described by many of the participants as *"demanding"*. Yet most of these students understood the value of the research and the end product - acutely aware of the skills and expertise they were building. This may have spurred them on despite waning enthusiasm and fatigue.

Students related the frustrations of not finding enough *relevant* information and having to re-focus and redefine their topics. Experiences like these can be challenging to a young research-er. It often feels that the information is within reach, yet unattainable. It is doubly challenging because the curiosity that drives the initial re-search question may be suspended indefinite-ly. Some students believed their original topics were entirely beyond investigation and, as a result, began a new pathway. Hence, teachers guiding students in their inquiry design should be aware of problems confronting students when obtaining particular types of information. Nevertheless, research questions can be adjust-ed in response to the information that is avail-able without completely abandoning the topic.

TIME MANAGEMENT AND SELF-REGULATION
Zimmerman (2008) acknowledges that self-reg-ulated learning is the cyclic interaction of be-haviours, cognitions and motivations respon-sible for enriching learning. Huie et al. (2014) go as far as to suggest that students, who have the motivation to excel but lack the desired self-regulation necessary for achievement, will probably not meet their desired goals. Manag-ing self-regulation appeared to be an issue ex-perienced around time management. Students felt that organisational and physical demands were barriers to completing their EE. Despite the recommended forty hours for the EE, many students exceeded those hours. Certainly, the challenges around time management and self-regulation are worth examining. As previ-ously suggested, the identified experiences of enjoyment and reward may not be enough for some students to achieve the full range of de-sired academic outcomes. A small number of participants did need supervisor support inter-vention to help them manage time and meet the submission deadlines.

The themes - **Enjoyment, Rewards and Chal-lenges -** contained numerous subthemes. Each subtheme acutely described the processes and emotions the students experienced as they ex-ecuted their autonomous research. It is tempt-ing to think of these themes as oppositional or binary, that is, the challenges may negate the enjoyment and rewards gained from complet-ing such rigorous research. The data shows these experiences can sit amiably alongside each other, allowing students to experience en-gagement with their research.

This concurs with Jaber and Hammer's (2016) re-search which found that it is possible that dichot-omous feelings of excitement and frustration are equally instrumental to engagement. These find-ings may help to answer the question raised by Sweller (2021) in his paper which suggests inqui-ry-based learning is harmful to students. Sweller (2021) questions why there never seems to be a rationale for inquiry learning and suggests there is no empirical evidence to justify its use. This case study found that cognitive overload can be man-aged, and students can be *well supported* as they delve deeply into autonomous inquiry. Many of the students in this case study were well-aware of the challenges involved in directing their own in-quiry, as one student stated, "Welcome challeng-es and prepared to be pushed" (Participant T). Well-designed inquiry-based research is intended to engage deep learning and successful discov-ery of purposeful information. To favour teacher directed research over inquiry-based research im-pedes opportunities to elevate student voice and encourage curiosity and enthusiasm for discovery.

Kuhlthau (1991) expected variations in research experiences when she proposed her six step ISP model. This model assumed a range of feelings, cognitions and actions, both positive and nega-tive, would occur as information users seek knowl-edge as well as understanding around an inquiry. The research process is not streamlined. It can be circuitous as the researcher experiences a range of emotions and behaviours at any given point. More importantly, these experiences provide key information to teachers to help them tailor sup-port for students during their research. The same understandings can help students approach re-search tasks with awareness and intent.

SUGGESTIONS

Opportunities to endorse student research beyond summative assessment can be actively pursued. Quality student research can be purposeful beyond the parameters of assessment. Schools can publish student work for the broader community, speaking events and podcasts. At the time of finalising this article, a Melbourne high school student authored an article on star parallax (Howard, 2021). Supported by his family, school and Swinburne University academics, fifteen year old Rudra wrote a scientific paper. Rudra stated, "It was inspiring that they took me seriously and I realised it didn't matter how young I was" (Howard, 2021). This is another strong example of valuing student voice and elevating student contribution to research.

The school where this case study occurred published the top EEs, as well as the abstracts of every student's essay. It continues to do so and electronic copies are found in the State Library of Queensland. It also replicated the *3 Minute Thesis* event that is usually organised at university level for PhD students. However, elevating autonomous student research does not need to occur on a grand level. School and community publications (online or print) can promote student voice.

Supporting students' affective behaviour throughout the process of inquiry has been explored in this paper. Teachers can also support student voice in this domain. I used the ISP model to encourage students to identify and articulate the stage they were experiencing when we met to discuss their research progress. Asking students to pinpoint which stage they feel they might identify with can help allay doubt and frustration by understanding that feelings of uncertainty, confusion or disappointment are all part of the process. It is equally empowering to celebrate feelings of clarity, satisfaction and accomplishment.

FURTHER INVESTIGATION

The phenomenon of the term "*temporary expert*" which evolved through the research findings, stood out to me. I questioned why was the adjective *temporary* used and why did this seem like the penultimate research experience to this student? This wonderment raised my awareness of the need for more research to enhance understanding about students' experience of autonomous inquiry. For example, after pursuing and exploring the information needed to produce that level of research, it is possible that these students understood their area of research with reasonable expertise within their educational context. What other experiences can educators provide to ensure students feel more like experts? How do educators move students beyond feeling temporary and maintain the space where students experience ongoing agency in their research?

Autonomous research appeared to affect change in the level of student engagement and enrichment. Thus, the findings from this case study have implications for all students, not only those studying the IB. Certainly, educators and teacher supervisors should continue to provide support frameworks and mechanisms to value and encourage student research beyond assessment to ensure students' experiences are meaningful, such as publishing and creating events around research produced. Educators can support students in moving beyond temporary and marginalised information use experiences, encouraging them to become more confident and proficient users of information through understanding the various emotions and cognitive stages experienced as they develop their research skills.

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