'Data data on the wall show me progress for them all': Using data walls to track student growth in learning

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The purpose of this small case-study is to gain an in depth understanding of how secondary school teachers perceive that data walls impact their teaching practices and subsequently, students' learning and growth. By drawing on a conceptual model of evidence-informed practice (EIP), this case study examined responses from secondary school teachers to review the role of data walls in their teaching and learning programs. Teacher participants provided anecdotal evidence to justify how effectively they perceive data walls to support EIP as well as the potential challenges of using data walls in a secondary school context. Findings show that data walls were specifically beneficial for prompting collaborative discussions, but were not holistically effective in supporting and sustaining EIP. The study concluded that data walls in secondary schools must be context specific. Further research into technological possibilities and the quality of data across various key learning areas (KLAs) is also necessary to ensure the efficacy of data wall use for diverse learning contexts.

Introduction

The rising pressures to turn education into a data-driven, or what has now come to be known as evidence-informed, decision-making process (Wayman & Jimmerson, 2014) has created incentives for more informed teacher use of student assessment and achievement data. The underlying assumption is that data use enables teachers to better target their instruction to student needs and strengths, ultimately resulting in higher achievement for all students (Datnow & Hubbard, 2016).

While the educational context is amassed with "information that is systematically collected and organised to represent some aspect of schools" (Lai & Schildkamp, 2013. P.10), the spotlight is almost always fixated on 'academic data' concurrent with student assessment or achievement data (Adie, Harris & Wyatt-Smith, 2020). This focus on student assessment data aims to facilitate evidence-informed practice (EIP) in schools through the collection of evidence derived from assessment data which is methodically organised and interpreted as a facet of learning (Prenger & Schildkamp, 2018).

Evidence-informed teaching is about promoting improvement actions that are consciously shaped by evidence to support student outcomes and facilitate school-wide development (Stoll, Earl, Anderson & Schildkamp, 2016; Brown & Rogers, 2015). More specifically, the intent of EIP is threefold: (1) to establish where students are situated along a learning continuum: (2) to regulate context appropriate teaching methods, strategies, and interventions; and (3) to track the growth of students and evaluate the effectiveness of teaching and learning programs.

EIP - a cycle of collecting, analysing, interpreting, acting on and evaluating evidence and trends in learning data - is neither an isolated nor neutral undertaking (Elwood & Murphy, 2015; Brown, Schildkamp & Hubers, 2017; Wyatt-Smith, Harris & Adie, 2018). The need for understanding and using data within schools by educators at all levels has seen the emergence of a range of tools that help to create a visual representation of student assessment data. One model that has been adopted by educational institutions in pursuit of understanding their students' achievement data is *data walls*. Data walls have been seen as the inevitable answer to the global call by policymakers to transform education into an EIP context (Schildkamp & Kuiper, 2010; Thrupp & White, 2013; Thrupp, 2018; Wyatt-Smith, Lingard & Heck, 2019).

By using a qualitative methodology this article looks at the following research questions:

(1) How does data wall use in a secondary school context relate to the stages of the EIP cycle?
(2) What does empirical data of teachers' perceptions reveal about the utility of data walls in secondary schools?

EIP for improving student outcomes

EIP has been facilitated through the focused approach of collecting evidence derived from assessment data which is methodically organised and interpreted as a facet of learning (Pregner & Schildkamp, 2018). As part of the recursive cycle of EIP, the actioning of improvement strategies must be shaped by data, which can be defined as information that is representative of aspects of schooling that has been collected, organised, analysed, interpreted, implemented, and evaluated (Lai & Schildkamp, 2013). The principle is simple; use the evidence of student achievement and growth in a robust way, that is to effectively determine the 'next steps' for learning. However, the Grattan Institute (2015) *Targeted Teaching* report suggested that the problem which Australian schools face is not teachers' inability to collect and organise relevant student data. On the contrary, schools have such a plethora of data that teachers are not effectively analysing, interpreting and transforming this evidence into actionable processes (Sharratt & Fullan, 2012; Goss, Hunter, Romanes & Parsonage, 2015). The findings in the *Targeted Teaching* report also indicate that the primary reason for this foundational weakness is problematically derived from educators feeling unconfident and underequipped to effectively use this glut of data to inform improvement actions within the classroom, according to individual need (Goss, Hunter, Romanes & Parsonage, 2015).

The New South Wales (NSW) Department of Education's Centre for Education Statistics and Evaluation (CESE) have recently updated their *What Works Best* publication and accompanying *What Works best in practice* resources that aim to provide "an accessible point of entry to the evidence on effective teaching practices" (CESE, 2020, p.4). The findings of the *What Works Best* report emphasise a strong correlation between EIP and high-performing schools. Specifically, professional learning communities that holistically incorporate EIP saw significant improvements across student outcomes (CESE, 2020). Therefore, as EIP is a continual and collaborative process, the need for diverse

stakeholders to be responsible for improving students' educational outcomes has motivated the development of collaborative data visualisation tools such as data walls (Sharratt & Fullan, 2012; Adie, Harris & Wyatt-Smith, 2020).

Data walls have potential in their utility to support EIP through keeping "data front of mind" (Adie, Harris & Wyatt-Smith, 2020, p.13). However, there is insufficient empirical evidence surrounding the cognitive and affective impacts of data walls on teaching and learning actions. Consequently, it would be premature to affirm or refute the position that data walls lead to significant improvements in students' achievement outcomes.

The potential of data walls to show students' growth in learning

Over the past decade, the model of data walls in the educational sphere has been increasingly promoted as an innovative, high-yield, data-informed practice (Singh, Märtsin & Glasswell, 2015). Understanding the potential and current benefits of data walls is therefore a necessary undertaking, particularly if the tool is being endorsed by the NSW Department of Education for school leaders with the prospect of it becoming an expected deliverable and operational norm in state classrooms and schools (CESE, 2020; Goss, Hunter, Romanes & Parsonage, 2015; Renshaw et al., 2013).

The principle of sustaining long-term improvement in student growth requires a consistent approach to data use (Schildkamp, 2019). This principle is supported by the transparency and accountability of data walls which necessitates continual reassessment of individual and school-wide practices, programs, and policies (CESE, 2020). The theory of data walls aims to facilitate a greater emphasis on supporting individual growth by ascribing 'faces' to each student on a highly visible, communal wall (e.g., in a staffroom, office, classroom). To achieve this, data walls are modelled to keep students at the forefront of improvement actions and learning decisions by using a unique avatar, tag, icon, or record card that reinforces the growth of students across skills in different academic areas. As students move along the learning continuum, data wall users will relocate a students' visual marker along the axis that will reflect where they have been and where they have progressed. Aligned with the EIP cycle, the 'action-orientation' of data walls is then intended to promote retrospective analysis of aggregated student data. The intention is that the high visibility of data walls, the individualisation and transparency of achievement data facilitates collaborative discussion between key stakeholders. In doing so, teachers and school leaders are more inclined to consciously and periodically consider 'next step' teaching strategies that target learners as knowable individuals (Sharratt & Fullan, 2012; Brown, Schildkamp & Hubers, 2017; Adie, Harris & Wyatt-Smith, 2020).

The affective impact of data walls

The framework for data walls in Australia has been largely shaped by the work of Sharratt and Fullan (2012) who advanced a social constructivist perspective of assessment. A key tenet of this approach is that the construction of knowledge and reality is an active process that develops within the bounded system of the learning environment (Liu &

Matthews, 2005). Diversity in understanding and meaning is thus influenced by the various ways humans socially, culturally, and experientially perceive and interact with the world. Differing perceptions of a shared phenomenon therefore provide greater scope of the processes of knowing and emphasise the significance of the contexts in which individuals operate. To obtain a holistic view of these working contexts necessitates a deep awareness of the cultural tools that are used (e.g., tangible teaching resources, assessment items, school policies and procedures), and how they are semiotically conveyed within the educational system (e.g., oral, and written communication, collaborative discussion, spatial or visual representations).

Elwood and Murphy (2015) have astutely observed that the development of digital power and the overwhelming influx of data have abetted a reductionist perception of schooling and assessment. The result of this reductionism has concerningly seen the oversimplification of the teacher's role into a technician and the masking of students behind numbers, rankings, and statistics. To overcome these perceptions, data walls have been developed with the intention to encourage teachers to engage with student data in a robust and personalised manner. As a fundamental facet of teaching, Sharratt and Fullan (2012) have argued that EIP is most effective when teachers' technical expertise is combined with an emotional investment and personal connection to the evidence of each individual students' growth. Therefore, the expectation is that teachers must be professionally equipped and supported to engage with individual students on both a cognitive and affective basis (Adie, Harris & Wyatt-Smith, 2020; NSW Government, 2021).

Conceptual framework

There are various models of EIP (Masters, 2018; Brown, Schilkamp & Hubers, 2017; Brown & Rogers, 2015), however a common recursive cycle is found within all models, as can be seen in Figure 1 which is built on what research has shown data literate teachers engage in when collecting, analysing, interpreting, and acting upon educational data. These stages, as presented in Figure 1, have been adapted in this study to provide the conceptual framework for examining teachers' perceptions of how data walls impact and relate to EIP.

Evidence to *identify*

The first stage as presented in the conceptual framework (Figure 1) is about establishing the starting point for targeted teaching strategies and developing appropriate learning goals and outcomes. In effective EIP, this preliminary stage involves key stakeholders triangulating past evidence of learning (such as previous assessment tasks, reports, and oral feedback) to draw inferences about where a student is situated along the learning continuum. In some conceptual models, this first stage of the EIP cycle is labelled as goal setting (Lai & Schildkamp, 2013), interrogating data, or framing the issue (Keuning et al., 2016; Masters, 2018). The main purpose of this step is for stakeholders to determine what has been achieved so that students' growth is monitored in relation to a frame of reference.
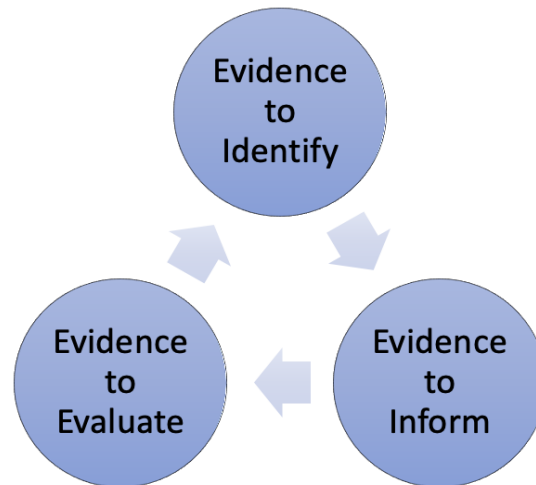
Figure 1: Conceptual framework: the EIP cycle

Evidence to *inform*

The second stage in the conceptual framework, as presented in Figure 1, encompasses developing improvement actions, personalised teaching strategies and interventions that extend students' prior knowledge, understanding and skills. This stage is most directly associated with evidence-based teaching. However, effective EIP involves more than responding with reactionary practices that lay claim to being 'next step' strategies. This phase in the cycle requires data literate teachers to engage with the collection, analysis and interpretation of data. Using 'evidence to inform' must be conducted in the broader context of understanding the learning domain itself (Masters, 2018). As such, the complex process also requires teachers to discern the 'how' and 'why' reasons for consistent patterns or observed trends in learning as they weigh up effective pedagogical decisions that are proactively implemented.

Evidence to *evaluate*

The third stage of Figure 1, the conceptual framework adopted for this study, is an integral aspect of the EIP cycle. It is imperative to recognise that the role of evidence in teaching and learning is to support a feedback loop: from teacher to student so that learning is *informed*, and from student to teacher so that teaching is *responsive*. It is often assumed that 'evidence to evaluate' is about teachers responding to the progression of learning at a student level. However, making a professional judgment about students' development and growth requires a holistic approach. Therefore, teachers must also use evidence of learning to assess, evaluate and then communicate the effectiveness of teaching methods, programs, and policies on a broader scale.

Method

This study was approved by the Human Research Ethics Committee of the University of Sydney. A qualitative research design using an instrumental case study was chosen to provide insight into the theoretical propositions of data wall use in secondary schools (Stake, 2008). In practice, data visualisation aligns with a social constructivist perspective that asserts teaching and learning as an interactive, collaborative, and social activity (Liu & Matthews, 2005). The aim was to capture evidence of participants' diverse perceptions of the role of data walls in their decision-making and pedagogical practice. These anecdotal data were then used to explicate how secondary school teachers understand, give reason for, and manage effective EIP.

Participants

The case study was conducted within one comprehensive high school in NSW that was identified as a best-practice school by a Regional Executive Director of School Performance at the NSW Department of Education. The 'real world' context of the research design aimed to reflect the naturalistic setting in which data walls are employed.

A representative sample of 11 respondents who had access to, and experience with using data walls were chosen to participate in the study. Participants included the Principal, Heads of Faculty, the Head Teacher of Teaching and Learning, and other experienced teaching staff.

Purposive sampling was used to select three teachers out of the 11 total participants to be interviewed in a secondary phase to collect more in-depth responses. These teachers were on the school's data wall project team and were therefore, more directly engaged with data wall theory and its application at the school.

Data collection

The collection and analysis of primary data was an iterative process which was derived from two methods of data collection: firstly, an online questionnaire and then semi-structured interviews. This was particularly impactful as the concurrency of data collection and analysis facilitated broader understandings of how data walls were approached in relation to the school's system-wide initiatives to improve student achievement levels (Miles, Huberman & Saldaña, 2014). The questionnaire was used to explore meanings and personal experiences with data walls (Fink, 2003) and to understand if there was diversity (Jansen, 2010) in how teachers in this context perceived the utility of data walls. To address the research intentions, an inductive approach was used which supported a 'goal-free' analysis of the results giving the researcher the ability to move from specific observations to broader generalisations and theories (Thomas, 2006).

Instrument

The questionnaire was designed to obtain a broad perspective of the perceived utility of data walls within the study's high school context. The items were related to the study's theoretical and conceptual framework. It consisted of three parts. Part I required participants to select five terms from a list of 26 terms that best described their perceptions of data walls in secondary schools.

The terms were thematically derived from larger studies like Adie, Harris, Wyatt-Smith's (2020) systemic review, as well as the primary research conducted by Sharratt and Fullan (2012). Part II was developed around 10 statements that had been individually derived from the stages in the EIP cycle, as can be seen in Table 1. Each participant's attitudes towards the statements were summated using a four-point Likert scale (strongly disagree, disagree, agree, strongly agree).

Table 1: A table of the statements used in part II of the questionnaire.
Each statement correlates to a stage of the EIP cycle

Data wall use in secondary school context:	Stage I: Evidence to identify	Stage II: Evidence to inform	Stage III: Evidence to evaluate
1. Helps teachers to establish clear learning goals and targets for their students.	X		
2. Serves to heighten teacher awareness of, and focus on, particular achievement issues.	X		
3. Is an effective, practical tool to represent collected data across different subject areas.	X		
4. Aids teachers in analysing and interpreting the evidence of student learning and progress.		X	
5. Enables collaborative conversations amongst teachers about individual students and specific learning needs.			X
6. Promotes the development of teachers' data literacy skills.		X	
7. Encourages teachers to refine their own evidence-based decision making.			X
8. Grows teachers' confidence in applying assessment data to daily instruction.		X	
9. Informs broader discussions between teachers about systems thinking and management of existing learning programs.			X
10. Fosters a wider teaching and learning community centred on sharing knowledge and strategies.			X

Part III proposed two open-ended questions that encouraged participants to firstly, reflect upon and justify their overall sentiments towards data wall use and secondly, identify any challenges they perceive in the practicability of using data walls in a secondary school setting.

Semi-structured interviews that aimed to understand how the participants implemented the information gained from the data wall within their classrooms to enhance the outcomes of their students were individually conducted over *Zoom* with the three selected participants who were on the data wall project team.

Data analysis

Data were analysed manually by the researchers through thematic analysis by examining the detectable sequences, patterns and regularities that contribute towards networking these components (Miles, Huberman & Saldaña, 2014). This theoretical scaffold supported the analysis of the primary data in three stages: representing the data, simplifying the data, and interpreting the data to justify conclusions that were congruent with the conceptual model of EIP (Miles, Huberman & Saldaña, 2014; Punch & Oancea, 2014).

The first researcher conducted and transcribed the interview data. The second researcher read the transcripts, provided peer examination, and re-evaluated the data analysis after the initial process to ensure trustworthiness. The transcripts were coded and analysed for core themes and dominant concepts using an inductive approach (Thomas, 2006). Both authors did repeated readings of the transcripts to ensure that the themes fully represented the study participants' comments. Codes were then derived, and organised, final themes were decided after several readings and consensus between the two researchers (Thomas, 2006). An important aspect of this study was the abstraction and categorisation of the empirical data using the three phases in the EIP cycle. The items within the questionnaire and prompts in the interviews were subsequently aligned with the study's conceptual framework to ensure coherence and consistency in the interpretation of participants' responses.

Findings

In part I of the questionnaire (Figure 2), 64% of the respondents identified that they best associated the term 'impractical' with data wall use in secondary schools. This was followed by terms such as 'burdensome' (55%); 'data analysis' (45%); and 'visualisation tool' (36%). In comparison, none of the respondents selected descriptors such as 'adaptable'; 'bottom-up driven'; 'goal-oriented'; 'innovative'; or 'student-centred'; suggesting that these characteristics did not best typify the application of data walls in a broader secondary school context.
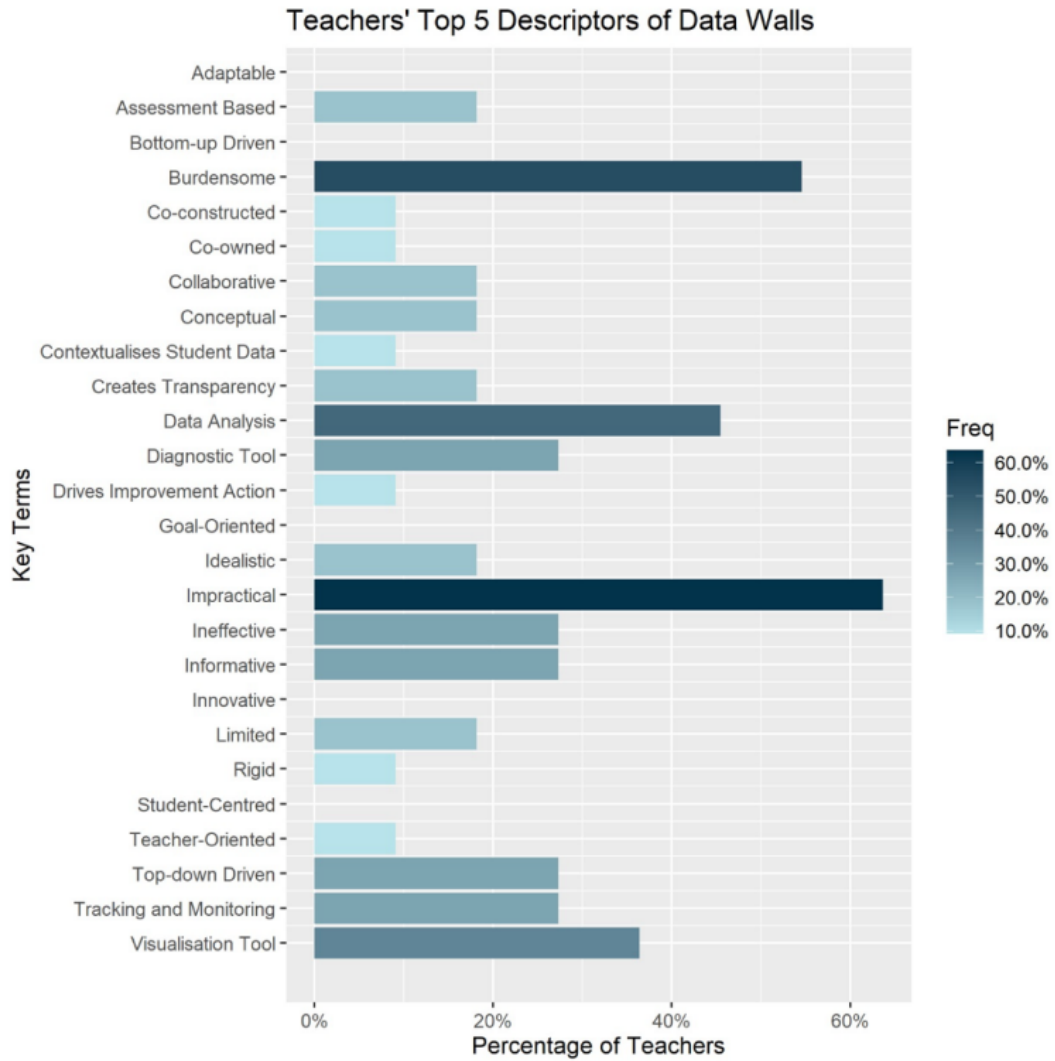
Figure 2: A horizontal bar chart of the proportion of teachers who felt that each term was representative of data walls, each respondent had to choose five terms

The distribution of responses over the various judgments illustrated that teachers held largely negative attitudes towards data wall use, with 45% of all chosen words having negative connotations. This contrasted the proportion of selected positive terms, making up only 18% of the data sample. A possible explanation for this difference could be found in the selection of more neutral terms (37% of all chosen words). Of these, "data analysis" (45% of respondents) and "visualisation tool" (36%) ranked highest, whilst "goal-oriented" and "student centred", both 0% respondents, ranked lowest.

This could suggest that while teachers acknowledged data walls as a tool for analysing and visualising student data, they may be less conducive for developing, communicating, and implementing student-centred outcomes. However, it is important to consider these preliminary trends within the broader scope of how data walls support or detract from effective EIP in secondary schools.

Evidence to *identify*

As summarised in Table 1, Statements 1, 2 and 3 are centred on the role of data walls in the "identify" stage of the EIP cycle. The teachers' responses in Figure 3 illustrate that they generally perceive that data walls aid them only partially in the "identify" phase of EIP.
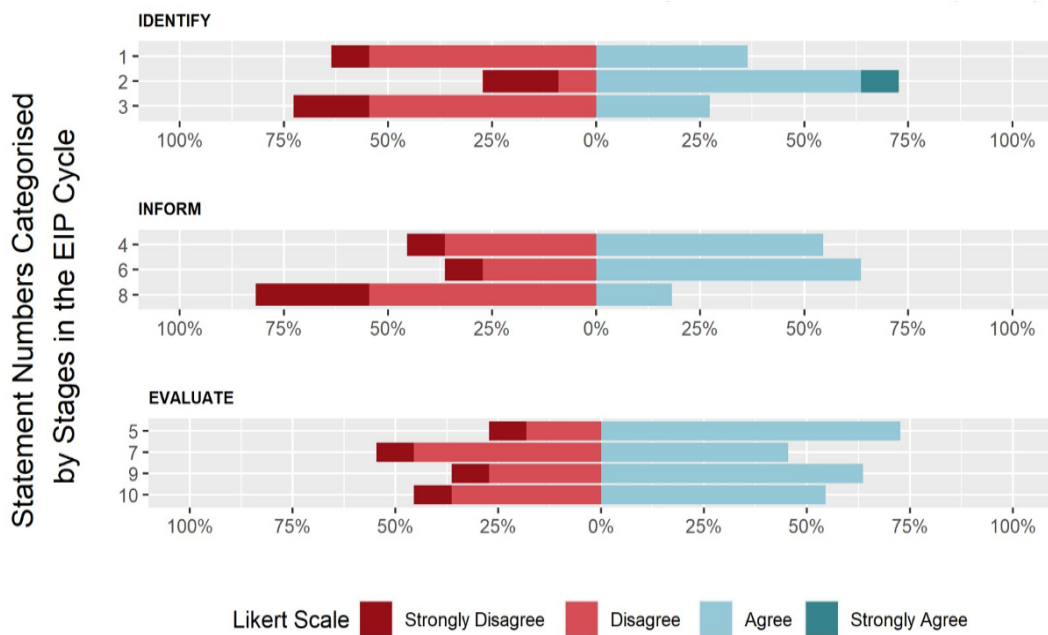

Figure 3: Teachers' perceptions of data walls from Part II of the questionnaire

From Statement 1 in Table 1, approximately 64% of all respondents considered data walls to be unhelpful in "establishing clear learning goals and targets for their students" to varying degrees. It was also emphasised that making targets was particularly difficult when considering "students' long-term learning", and "making individual student targets that were aligned with school goals that have already been set for us (teachers) by the Department of Education".

Furthermore, from Statement 3 in Table 1, about 73% of respondents found data walls to be an inefficient and impractical tool "to represent collected data over various subject areas". This was also revealed in comments such as:

you can construct a data wall to identify where students are in one class at one point in time. But there are so many external factors that affect how our students perform that their achievements are not truly identified through a data wall based on assessment. (Participant 1)

Interestingly, the distribution for the responses for Statement 2 in Table 1 proved to be more favourable, with 73% of the teachers agreeing to some extent that data wall use "heightened [their] awareness of [and] focus on particular achievement issues".

Evidence to *inform*

From Table 1, Statements 4, 6, and 8 correlate to using data walls to support the "inform" stage of the EIP cycle. Overall, respondents identified that data walls have potential to support teachers' engagement with the collection, analysis, interpretation, and application of data. From Figure 2, approximately 55% of all respondents identified that data walls effectively "[aid] teachers in analysing and interpreting the evidence of student learning and progress". These perceptions were largely consistent with responses to Statement 6 as 64% of the teachers indicated a positive sentiment towards data walls as one participant stated:

> … [promoting] the development of teachers' data literacy skills and assist in the development of a common language for sharing students' progress with all teachers and school leaders within our professional learning community. (Participant 2)

Despite this, the responses revealed that data wall use did not "grow teachers' confidence in applying assessment data to daily instruction". This shift in attitude is shown in Figure 3 as the questionnaire provoked 55% of respondents to disagree and 27% to strongly disagree with Statement 8. One participant clearly stated this:

> Subject areas are so different and require a vast array of skillsets that it is almost impossible to inform appropriate subject-specific instructions by comparing student achievement across subject areas on a data wall. (Participant 3)

A recurring sentiment correlated this lack of confidence with teachers' allocation of time as most teachers noted that data walls took too much "valuable time" away from planning, implementing specific strategies, and teaching.

Evidence to *evaluate*

Teachers showed a more favourable perception towards the impact of data walls on their ability to use evidence to "evaluate". Figure 3 indicated that approximately 73% of all respondents believed that using data walls in a secondary school context "enables collaborative conversations amongst teachers about individual students and specific needs" (see Table 1). One teacher affirmed that:

> The collaborative nature of data walls stimulated discussion with other teachers – it was mainly asking them what they're doing to support a particular student or group of students, and vice versa. (Participant 2)

It was noted that participants were more evenly distributed in relation to Statement 7 with 55% conveying to a varying extent, that data walls did not encourage them "to refine their own evidence-based decision making". One participant responded by stating that:

> It may be useful for individual classes to be placed on a data wall to enable effective feedback and to be aware of where students require assistance, but I can already attain this information using a simple traffic light system on an Excel spreadsheet. (Participant 3)

On the other hand, teachers' impressions were more positive towards Statement 9 as 64% of responses noted that data walls "inform broader discussions between teachers about systems thinking and management of existing learning programs". Teachers recognised that data visualisation stimulates conversations around student assessment and one participant noted that students should also be part of the data wall discussions and that:

> It's on the table for discussion along with other digital options and programmes we are investigating. (Participant 2)

Finally, there were mixed feelings towards data walls "foster[ing] a wider teaching and learning community centred on sharing knowledge and strategies", with 55% of teachers agreeing and 45% disagreeing to different extents. Teachers who held positive sentiments noted that "all staff were involved". But the evaluative nature of data walls was also challenged, where teachers noted that data walls did not "enrich the quality of feedback given to students" and that "teachers and leaders don't need a data wall to collaborate on student growth".

Discussion

The findings of this case study highlight teachers' diverse perceptions of how data walls relate to the individual stages and recursive cycle of EIP in secondary schools. As the nature of 'best practice' continues to be shaped by curriculum reform, it is essential that school leaders review the benefits, hindrances and potential challenges associated with data walls before implementation (NSW Government, 2021).

Data walls as an asset to teaching and learning programs

From the empirical data of teachers' judgments, the main asset of data walls in secondary schools is presenting a visual map of students' achievement along the developmental continuum. The key implication for teachers is that as they collect meaningful evidence over time, connections between the datasets build up a holistic image of teaching, learning and student growth (CESE, 2020; Hattie; 2012; Masters, 2018). This has a significant impact on teachers' advocacy and personal responsibility for student progress, especially as foundational skills taught in Stages 4 to 6 prepare students for life.

Similarly, another asset of data walls is their dependence on co-construction, co-ownership, and collaboration. They promote a public forum for rich discussion about significant assessment trends, achievement standards and targeted student needs (Sharratt & Fullan, 2012). The data displays can be tracked and periodically reviewed, providing teachers with working evidence to identify where students have been and where they are heading. On a system-wide level, the NSW Curriculum Review emphasised using 'evidence to identify' as a growing priority to maximise learning in the middle and later years (NSW Government, 2021, CESE, 2020). The underlying principle is to "build strong foundations" by "identify[ing] the points [students] have reached… so that learners are presented with appropriately challenging material" (NSW Government, 2021, p. 10).

It is also a shared sentiment that effective practitioners participate as learners, and through participation, school leaders learn effectively. Pertaining to the third stage of EIP, data walls see greatest benefit in secondary schools as an evaluative tool to foster teachers' professional capacities (NSW Government, 2021; Mandinach, Friedman & Gummer, 2015).

A hindrance to teaching and learning programs

As an intervention and prevention tool, there are obstacles to effective data wall use in secondary schools. It is heavily reliant upon the ability of data literate users to translate evidence into information, and information into action as well as the quality of the assessment data upon which the decisions are made. The findings revealed that data walls in a secondary school context only partially support the individual stages of the EIP cycle, notably 'evidence to *identify*' and 'evidence to *inform*'. Combined with issues of privacy and mediating the affective domain, data walls are also primarily used by teachers, rather than students or other stakeholders in secondary schools.

Furthermore, this tool requires a deep level of abstraction to discern the *how* and *why* questions of emerging trends and patterns in student achievement (Masters, 2018). It is also evident that data walls stimulate collegial conversation to a certain extent. However, as individual teachers identified, most of the specific and in-depth pedagogical decision-making takes place beyond these collaborative spaces.

Arguably, part of this can be attributed to the identification of "time" by the teachers as the biggest challenge facing data wall usage in secondary schools. Therefore, unless professional and administrative support is embedded within a broader school approach, the implementation of data walls in secondary schools threatens to be tokenistic.

Another hindrance is related to the nature and quality of the assessments being used. Making holistic judgments on a narrow component of the curriculum, without acknowledging other evidence, detracts from the validity of the results. Respondents also identified that there was a significant disconnect between implementing data walls and developing clear learning goals and targets.

Conclusion and future directions

At present, using data walls to shape, tailor, and articulate student-centred outcomes remains a gap in the literature and in practice. From this perspective, data walls in secondary schools appear to be more useful in strategic planning within the professional learning communities compared to daily instruction conducted by individual teachers. This small case-study aimed to gain a better understanding of how data walls were being implemented within one secondary school in NSW. Generalisation of results beyond this school context was not an aim.

The findings of this case study lend themselves to two suggestions for effective data walls use in secondary schools. Firstly, the digitisation of data walls into 'digital dashboards' could address two raised concerns: (a) time-poor teachers; and (b) issues of privacy as other stakeholders engage with data. Time could then be more effectively allocated to develop supportive measures for teachers to better use evidence to *identify* needs, *inform* proactive strategies, and *evaluate* teaching and learning progressions. Digital options could also mitigate concerns about data privacy and sensitivity, which Sharratt and Fullan (2013) brought up as a field of concern in this area. Source data can be concealed or anonymised whilst making visible the graphical representation of achievement results, student attendance, progress reports and other contextual notes (Williamson, 2016). Another concern of digitising is that the whole concept of data walls relies on capturing the human side of the data as teachers make instructional decisions (Sharratt & Fullan, 2013). To maintain this theory of 'faces' (Sharratt & Fullan, 2012), a student icon or profile can be assigned to the collated data as discussions occur within the wider professional community. Replication of this study across nearly all high schools that use data walls in NSW would yield valuable information on their presumed positive impacts on student outcomes and growth in learning.

In examining teachers' perceptions of EIP, three conditions need to be present to effectively implement data walls in secondary schools. Firstly, there must be a system-wide commitment to collaboration, cooperation, and co-ownership in students' growth. Secondly, it is also important that data wall users receive consistent support in their administrative tasks, professional development, and affective capacities. However, it is neither a sustainable nor effective practice if these directives are solely top-down driven (Adie, Harris & Wyatt-Smith, 2020). Finally, it should be recognised that data walls are only one element within a multifaceted approach to support EIP and drive improvement actions in an educational setting (Wyatt-Smith, Harris & Adie, 2018). To concretise these systemic changes, consistent, "whole school engagement matters" (CESE, 2020, p.5).

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