Flipped learning and parent engagement in secondary schools: A South Australian case study

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Abstract

Parent involvement in and engagement with children's learning has been shown to strongly influence student achievement, engagement, motivation and school completion. However, parent involvement decreases once students reach middle school, as subject content gets harder, the number of teachers increases, and students are less likely to share their homework and learning with parents. To this end, the flipped learning approach has received growing attention, with evidence of improved higher order thinking and collaborative skills, and increased transparency for parents. This article explores school leader, parent, student and teacher perceptions of the flipped learning approach, through the lens of a one-year case study of two rural South Australian schools, in order to uncover how the approach affects parent engagement. Findings reveal that, whilst stakeholders feel that the flipped approach is beneficial for absent students, to reinforce content and increase student responsibility, it has not improved transparency for parents, with a disconnect between what schools think parents know and are engaging in, and the actual level of parent engagement in student learning. Recommendations for schools implementing the flipped learning approach are provided against a bioecological model, adapted for this study.

Practitioner notes

What is already known about this topic

- Parents play a vital role in the learning journey of students, although less is known about their perceptions of flipped learning (FL) in schools.
- FL has been gaining popularity, however far less research has been undertaken in schools.

What this paper adds

- Stakeholders feel that FL supports students who are absent or who require content reinforcement, increases students' sense of responsibility, centres parent-teacher conversations more on learning, and has the potential to increase student engagement.
- Whilst teachers feel that FL increases transparency for parents, parents and students do not.
- Misconceptions of parent engagement and knowledge of school processes can hinder FL efficacy.

Implications for practice and/or policy

- Schools should conduct a needs analysis and implement a whole school approach to parent engagement and implementing FL, with school leaders playing a key role.
- Increased support of FL through funding of equipment and professional development, as well as less staffing changes.
- Gaining support from governing council, and offering combined FL workshops for parents and teachers may increase transparency and strengthen links between home and school.

Introduction

Parental involvement in and engagement with children's learning has been shown to strongly influence student learning achievement (Castro et al., 2015; Hill & Tyson, 2009), motivation towards school (Heatly & Votruba-Drzal, 2018), homework understanding and completion (Patall, Cooper, & Robinson, 2008), language competence and psychological wellbeing (Wong et al., 2018), as well as student engagement (Doctoroff & Arnold, 2017). However, by the time students reach middle school, parent involvement decreases (Oswald, Zaidi, Cheatham, & Brody, 2018), with many parents unsure of how to help their children's learning (Goodall, 2016), or lacking the confidence to try (Povey et al., 2016). The increased number of teachers that students have in middle and secondary school, as opposed to primary school, also makes the task to develop meaningful and productive two-way relationships between teachers and parents difficult (Hill & Tyson, 2009), with students (often unknowingly) hindering the process through keeping information about opportunities for engagement from parents (Crozier & Davies, 2007). The use of technology has the potential to counter this disconnect, and thereby improve parent engagement, through allowing parents direct, regular and immediate access to an increased amount of information about student learning (Goodall & Vorhaus, 2011). Evidence of and guidance for schools to effectively use technology to enhance parent engagement, however, is lacking (EEF, 2018; Goodall, 2016).

The flipped learning (FL) approach has been touted as having "great promise" (OECD, 2018, p. 77) as a way to bring digital technology more into the classroom, increase student engagement, and to involve parents more as partners in the learning journey of their children. Teaching has (and should) move towards a more student-centred model, endeavouring to develop students into independent learners "outside and outwith the classroom" (Goodall, 2018b, p. 604), and there is evidence that middle school students may not benefit from direct parent involvement in homework (Patall et al., 2008). FL could be one method to increase transparency for parents (Gough, DeJong, Grundmayer, & Baron, 2017) and raise their confidence and self-efficacy with homework (Muir, 2015), whilst continuing to give students their independence (Wei et al., 2018). There is, however, a need for greater theorising of parent engagement (Goodall, 2018a), as well as a focus on parental involvement in and engagement with FL (Goodnough & Murphy, 2017; Ramaglia, 2015). In light of the vital role that parent engagement plays in children's learning, this article uses a subset of data from a larger South Australian case study on FL in schools, to take a social view of digital technologies (Selwyn, 2012). Delving deeper into the perceptions of students, teachers and parents, this article is an important addition to the literature, drawing together research on student engagement, parent involvement and engagement, and flipped learning, through a sociocultural lens.

Literature review

Student engagement

Developing and enhancing student engagement (SE) is a key goal of educators and it has been the subject of much debate in educational research, owing to its complex and multifaceted nature (Appleton, Christenson, & Furlong, 2008; Eccles, 2016). For the purposes of this study, SE is defined as:

> "the energy and effort that students employ within their learning community, observable via any number of behavioural, cognitive or affective indicators across a continuum. It is shaped by a range of structural and internal influences, including the complex interplay of relationships, learning activities and the learning environment. The more students are engaged and empowered within their learning community, the more likely they are to channel that energy back into their learning, leading to a range of short and long term outcomes, that can likewise further fuel engagement." (Bond, Buntins, Bedenlier, Zawacki-Richter, & Kerres, Manuscript in preparation, p. 2)

It is influenced by a range of sociocultural, structural and psychosocial influences (Bond et al., Manuscript in preparation) and through considering the wider socio-political context that influences SE, a more holistic and clearer understanding of the concept can be gained, which allow educators more insight into how to further build engagement and ultimately improve outcomes for students (Appleton et al., 2008).

At the individual student level, internal psychosocial influences on SE include a student's personality, skills, motivation, self-concept, self-regulation, self-efficacy, subject interest and wellbeing (Bandura, 1995; Reschly & Christenson, 2012). However, it also includes their prior experiences with technology, computer self-efficacy and their technology acceptance (Moos & Azevedo, 2009; Pellas, 2014). Within the wider structural and psychosocial influences on student engagement, it is vital to include influences at the institution level, including a school's ICT policy, culture, leadership, curriculum and infrastructure, such as desktop computers, internet access and access to IT support (Cheng & Weng, 2017). Influences at the student level include a student's access to technology at home (Warschauer & Xu, 2018), their background and cultural milieu (Eng, Szmodis, & Mulsow, 2014), including level of parent education (Diogo, Silva, & Viana, 2018), as well as their 'lifeload', "the sum of all pressures a student has in their life" (Kahu, 2013, p. 767). This can include family income (e.g., Adhikari, Mathrani, & Scogings, 2016), family relationships (e.g., Howell, 2013), and extra-curricular activities (e.g., Marquis, 2009).

External psychosocial influences on SE include the school community, teachers, peers, and the wider community in which the student is situated (Aldridge & McChesney, 2018; Quin, 2017). Another particularly important relationship, vital in fostering SE within the classroom, is that between students and their parents and families (Bempechat & Shernoff, 2012; Raftery, Grolnick, & Flamm, 2012). Parental involvement in schooling is a vital partnership that plays a large role in the learning community and ecology for children (OECD, 2018). A number of models have been developed around parental involvement, including the Hoover-Dempsey and Sandler model (Hoover-Dempsey et al., 2005) and the Adolescent Community of Engagement Framework (Borup et al., 2014), developed for use predominantly within online learning environments.

Parent Engagement

Parent involvement, however, is a "stepping stone to parental engagement in learning but it is not sufficient to improve learning outcomes on its own" (EEF, 2018, p. 10). Rather, parent involvement is at the beginning of a continuum, shifting from (often one-way) relationships between parents and schools, to parental engagement with children's learning, where parents work in partnership with teachers and schools (Goodall & Montgomery, 2014; Pushor, 2012). Parent engagement arises out of sociocultural theory, which highlights the value of school-home interaction (Goodall, 2016). Parents model learning and its value in the home from birth (Goodall & Montgomery, 2014), developing vital 'parental knowledge' (Goodall, 2018b; Pushor, 2012). Parent engagement sees schools acknowledge that rich parent knowledge and build upon it, to enable the co-construction of shared values and to work towards achieving a shared vision (Emerson, Fear, Fox, & Sanders, 2012; Pushor & Amendt, 2018). This includes engaging in clear, reciprocal feedback loops between the school and home (Schneider & Arnot, 2018).

There are, however, a number of challenges to parents engaging with their child's learning and building a culture of parent engagement within schools (see Appendix A), including the use of technology for enhanced school-home communication, especially within secondary schools. Whilst primary schools have been found to communicate weekly, secondary schools are more likely to do so monthly (Povey et al., 2016), thereby decreasing opportunities to produce effective feedback loops between school and home (Schneider & Arnot, 2018), and raise parent involvement and engagement. Other technology-specific challenges to parent engagement include the family economic situation and ability to afford equipment (Hohlfeld, Ritzhaupt, & Barron, 2010), a lack of internet access (Hollingworth et al., 2011), parents not being interested in using technology (Beckman, Bennett, & Lockyer, 2019) or having low technology self-efficacy (Povey et al., 2016). Teachers' past negative experiences with digital technology can also impact on parent engagement (Willis & Exley, 2018), as does a lack of focus on working with parents within pre- and in-service teacher education (Goodall, 2018d; Pushor & Amendt, 2018), and teachers ability to access published research (Goodall, 2018c).

Theoretical Model

In addition to a range of student engagement and child development literature, that stress the importance of acknowledging its sociocultural positioning (Kahu, 2013), this study draws on the work of Bronfenbrenner and colleagues (Bronfenbrenner, 1979; 1986; Bronfenbrenner & Ceci, 1994), who

examined a range of external influences that affect families and child development. They posited a bioecological model, adapted for this study (see Figure 1), that encompasses the individual child and the microsystem in which it is placed, nested within a system of interconnected environments; mesosystem, exosystem, macrosystem and chronosystem. Bronfenbrenner argued that the interconnections within and between elements of each system have a profound effect on child development and on their ability to engage with learning. This model has been used to inform and guide a range of research on child learning and parent engagement (e.g., Ansong et al., 2017; Heatly & Votruba-Drzal, 2018). Schwab's (1973) framework of curriculum redevelopment has also been used to guide parent engagement research (e.g., Willis, Povey, Hodges, & Carroll, 2018), which includes four interconnected dimensions: curriculum, students, teachers and milieus (school, classrooms, family/parents, community). Within a study of Australian principals and parent and community presidents, (Willis et al., 2018) technology played such a large part in developing, sustaining and improving parent engagement, that it was added as a further milieu.

Figure 1 Bioecological model of influences on student engagement

Flipped learning approach

Flipped learning (FL) is a student-centred approach, with theoretical foundations in constructivism and collaborative learning theory (Bishop & Verleger, 2013), and it has gained momentum recently "as a promising method to effectively engage students in the learning process and to develop their digital competencies" (Kostaris, Sergis, Sampson, Giannakos, & Pelliccione, 2017, p. 261). FL requires students to complete work at home that would traditionally be done during class, such as teacher explanations or lectures, in order to free up class time for collaborative activities in the group space. Despite its growing popularity, a lack of agreement exists on its exact definition (Hao, 2016; Song & Kapur, 2017), with some arguing that it must include an out-of-class video component (e.g., Bishop & Verleger, 2013) and others suggesting that it does not always involve the use of videos (e.g., Bergmann & Sams, 2012; Gough et al., 2017). In order to provide clarity, early FL developer Jon Bergmann and the Flipped Learning Network organised an international delegation (the Flipped Global Standards Project), who co-constructed a definition:

> "Flipped Learning is a framework that enables educators to reach every student. The Flipped approach inverts the traditional classroom model by introducing course concepts before class, allowing educators to use class time to guide each student through active, practical, innovative applications of the course principles." (St. Clair Smith, 2018)

Whilst the definition does not mention technology explicitly, most researchers agree that FL includes "interactive group learning activities inside the classroom, and direct computer-based individual instruction outside the classroom" (Bishop & Verleger, 2013, p. 4).

There is a growing body of evidence to show that FL can promote collaboration, teamwork and problem solving skills (Lo & Hew, 2017), can positively impact subject knowledge and skill development (Aidinopoulou & Sampson, 2017), and that it increases time for active learning and higher order thinking (Gough et al., 2017). However, the recent review by Lo and Hew (2017) identified that there are many student-related, teacher-related and operational challenges to overcome, to ensure that the approach does not disengage students. This includes the need for both teachers and students to have prior digital competency (Yilmaz, 2017), as well as a sense of readiness for and awareness of how the FL approach works (Gilboy, Heinerichs, & Pazzaglia, 2015). However, given the importance of parent involvement in and engagement with children's learning, it is also important to understand parent perceptions, and how they might impact on the approach.

Parent perceptions of flipped learning

Insight into parent perceptions of the FL approach in schools is limited. Some parents are uncomfortable with the approach (Collins, 2017; D'addato & Miller, 2016), not considering watching videos at home to be appropriate homework or conducive to learning, for example, which can lead to a lack of support in encouraging students to watch them (Goodnough & Murphy, 2017). There is evidence, however, that positive parent attitudes towards FL results in more positive attitudes in their children (Oyola, 2016), and that FL can lead to increased transparency of the learning process for parents (Gough et al., 2017). In a study of 10 teachers and six school leaders (Collins, 2017), homework completion increased as a result of parents engaging with the approach. Participants reported that the videos allowed parents to see and understand how to solve complex Maths problems, which enabled them to be more active and involved in helping their children. This was also found in another study (Muir, 2015), where parents felt that having the videos at home made them feel less "isolated" (p. 449). Given that many parents have feelings of incompetence with (particularly secondary school) homework due to subject content or task requirements (Schneider & Arnot, 2018) and therefore disengage with their child's learning, FL has the potential to raise parent self-efficacy and potentially further involvement and engagement in their child's education.

This study, therefore, seeks to further understanding of how the FL approach can affect parent engagement with learning, and subsequently student engagement, by examining stakeholder perceptions of the approach. Specifically, it seeks to answer the questions:

1. What are school leader, parent, student and teacher attitudes towards and perceptions of the flipped learning approach in secondary school?
2. How does the flipped learning approach affect parent engagement?

Methodology

A case study using mixed methods was conducted across one year (December 2017 – December 2018), with one aspect of it presented here. Case studies allow examination of a phenomenon from different angles "in its natural setting" (Willis, 2008, p. 212), triangulating research, thereby ensuring the validity of findings (Yin, 2014).

Research Context

This study was undertaken in two rural government South Australian schools, located approximately two hours from the state's capital city, Adelaide. Site One (S1) is a high school with approximately 550 students across Years 7-12. A FL professional development (PD) group was established for teachers at the school in 2016, evolving into a Network Learning Group (NLG) in 2017, for any teachers from across the local region. Site Two (S2) is a school with approximately 1,200 students across Reception

to Year 12. A flipped NLG was first established in 2014, to support teachers from the region in implementing the approach.

Participants

All teachers at both sites were invited to the study, with 12 agreeing to participate. They were then issued with information packs and consent forms for all students in their classes. Of those teachers, four (33%) agreed to ask one class to participate in the study, resulting in 72 students and their parents being invited to participate. In total, this study included the principals from both schools (n = 2), five teachers from S1, seven teachers from S2, students (n = 37, 51% of invited participants) from four classes (Year 7 Maths, Year 7 Creative Arts, Year 12 Physical Education, Year 12 Chemistry) across both sites, and parents (n = 16) (see Appendix B for demographic information).

Ethics

Prior to beginning the study, permission was obtained from the University of Oldenburg Human Research Ethics Commission (approval number 1r73/2018), and from the South Australian Department for Education and Child Development (approval number CS/17/000750-1.11). Written consent on voluntary and anonymous participation was then obtained from all participants, including parents of all student participants.

Data Collection

Multiple data sources were collected, including questionnaires (using 5-point Likert scale and open-ended questions), semi-structured interviews with principals and teachers, classroom observations and semi-structured focus groups (n = 7) with students. For the purposes of this article, aspects of the questionnaires, semi-structured interviews and focus groups that refer to parent, student, teacher and school leader perceptions of the approach, or to parent involvement or engagement in learning at the secondary level (Year 7 upwards), are included for analysis.

All surveys included demographic questions, as well as questions from previously validated questionnaires: technology use from the Media Use Survey (Zawacki-Richter, Kramer, & Müskens, 2016), questions about IT skills, knowledge and use, adapted from the 'Online Learning Readiness Scale' (Hung, Chou, Chen, & Own, 2010) and the 'I & CT Scale' (Huang & Hong, 2016), as well as questions on their definition, use and perceptions of flipped learning, used in the survey by Gough et al. (2017). 16 parents completed either an online or paper-based survey. 23 students responded to Questionnaire 1, six of those students then responded to Questionnaire 2, and a further 14 students participated in focus groups, but did not complete a questionnaire. Focus groups (n = 7) were held with students (n = 23) from Years 7 and 12, and digitally recorded and transcribed.

Semi-structured interviews were held with principals and teachers, either in person or over the phone, digitally recorded and transcribed. Interviews were held in December 2017 (with 9 teachers and two principals) and in May 2018 (with seven teachers, six of whom were undertaking a second interview). For "authentic triangulation", data collected and analysed were verified by the participating teachers to confirm "findings across time, space, and perspective as well as source" (King & Mackey, 2016, p. 219). Unfortunately, despite 16 parents indicating that they would be willing to participate in an interview on the consent form, no parents were available during (or since) the time of data collection, which is a serious limitation of this study. However, this is not the first study to report difficulties engaging parents in research (e.g., Schneider & Arnot, 2018).

Researcher Bias

The author is a former teacher and was known to teachers and some of the students at both sites, which may have affected how they chose to respond. However, this familiarity might also have prompted participants to feel more comfortable in responding. The author has also used the flipped learning approach in her own teaching and is, in general, an advocate for the approach. However, this advocacy includes a desire to uncover stakeholder perceptions, whether positive or negative, to ensure positive outcomes for students.

Data Analysis
All interview and focus group transcripts were read and open coded (Cohen, Manion, & Morrison, 2011) by highlighting sentences or phrases that identified how students, teachers and parents perceived the flipped approach, which were then classed into more refined themes and categories. Descriptive statistics were obtained from the analytics calculated within Survey Monkey.

Results
School leader perceptions of flipped learning
Interviews with the two site leaders revealed the obvious disparity between the lengths of time that the schools have been implementing the approach. S1 has only been "dabbling" in FL for "2 or 3 years maybe" with "only… a handful" of teachers exploring the approach, with limited support from the school by way of 4-yearly meeting times, and with the sourcing of equipment to facilitate FL "left…to the poor old device of the teacher" (S1P). In contrast, FL for S2 has been "a growing thing over time", with "a number of staff" funded to undertake certification through the Flipped Learning Global Network, extra meeting time scheduled throughout the year, and "a new multimedia centre…that will provide high quality resources easily on hand for teachers" (S2P). This difference in the level that FL has been integrated into the school culture and community was reflected in the leaders' opinions about parent knowledge of and involvement with the flipped approach. S1P was not aware whether "parents or students...fully understand how [FL] could impact their learning" and reasoned that "maybe…those [teachers] haven't been asked to do that, or it hasn't been suggested that they do that". At S2, however, parents have "been involved, they're on the journey", and "recognise the effort staff go to for [their] students" (S2P). Governing council, which involves parents, are aware of the approach, and are supportive of the direction the school is heading in, and the Year 11 and 12 teachers have also talked about FL at their family nights at the start of the year.

The disadvantages of FL mentioned by S1P also reflected less understanding of the approach, concerned that the "emotional connection or a relationship with their teacher…is not going to be there", that students might think "oh I don't have to go to school, I could do this at home", and that teachers might effectively stop teaching, saying "oh I've done my resource, my FL pack, send it out, there it is" (S1P). SP2, on the other hand, was more concerned that teachers gain "a really clear headset on what flipped is about, why flipped, and how they can use it", to avoid "a very work dominant environment, where the work…or the flipped production is outweighing other things" (S2P). Both leaders were concerned about parent access to devices and the internet, but felt that FL could assist students who are absent, e.g., through school based apprenticeships, as well as providing students with the opportunity to revisit content. S2P also mentioned that providing flipped feedback, where teachers record themselves talking through assessment feedback, has led to "really powerful results", as has teachers preparing videos for students to watch when teachers are absent.

Parent perceptions of flipped learning
The parents in this study consider themselves confident users of IT. Of the 16 parents surveyed, 15 own a laptop that their children can access, 14 own a tablet, 12 own a smartphone with an internet connection, and nine own a desktop computer. All but one parent has an internet connection at home, with most rating the speed as 'alright' or 'very good'. They strongly feel that it is important for their child's future to use online learning tools (4.67 on a 5-point Likert scale) and they encourage them to learn new things via online learning (4.20). 15 (93%) parents feel that their school is supportive of integrating technology into the classroom, through providing access to technology, implementation of a 1:1 Bring Your Own Device (BYOD) program, teacher involvement, and through encouraging the students to engage with technology. However, when asked to describe the school's infrastructure and internet connection, six parents indicated that they either "don't know about the infrastructure" (P25) or that the "internet connection is up and down like a rollercoaster" (P15), whereas six parents felt that their school has "very good tech infrastructure" (P33) and that it "opens up so many resources for the children" (P11), which shows a disparity of opinion and understanding amongst parents of the infrastructure available to support their children at school.

When asked to define FL, 14 parents responded, identifying watching videos, the online delivery of content, freeing up time at school and pre-reading at home. Three parents (21.43%) admitted to having

no idea what flipped learning is, although a definition was provided to them on the next page of the questionnaire, so that they could continue their involvement in the survey, and five parents "don't feel [they] know enough about [how the school is integrating the approach] yet" (P25). Parents were then asked to rank 11 statements exploring their perceptions of flipped learning (see Appendix C), adapted from the survey used by Gough et al. (2017). Most parents feel that FL helps their child because they are able to re-watch sections of videos that they do not understand, and that it is also helpful when students are absent. They also feel that discussions with teachers now centre more on learning, rather than on behaviour, that students have a greater sense of responsibility when it comes to their learning and, to a smaller degree, that assignments and academic performance have improved, and that students are more engaged. However, they are unsure of whether it helps their child learn better, or whether their child prefers flipped over traditional models. Parents also reported not having watched any of their child's flipped content, indicating that the flipped approach is not increasing transparency for these parents, unlike in other studies (e.g., Collins, 2017; Muir, 2015).

Student and teacher perceptions of flipped learning

In order to identify whether parent perceptions of FL are shared by teachers and students, a comparison was made of survey responses with the same questions (see Appendix D). All stakeholders agreed that the approach assists absent students, that students feel slightly more engaged at school, re-watching videos is helpful, that students have a greater sense of responsibility, and that discussions between parents and teachers centre more on learning. The last two findings are in contrast to the study by Gough et al. (2017), who found that the flipped approach did not steer parent-teacher conversations more towards learning, and teachers did not feel that students were more responsible. However, although teachers indicated in the surveys that FL is having a great impact on improving transparency of learning for parents – a feeling that has grown across the past year (see Appendix E) – the interviews told a different story. Six teachers had not spoken to parents at all about the approach, with two mentioning a lack of parent appearance at parent teacher interviews and one suggesting that it is lack of involvement and awareness of what is going on at the school in general:

> …I teach about 200 students, 250 students, and I think I had eight parent teacher interviews and a lot of them didn't even realise that they could get onto Daymap [the school LMS], so… not a lot of parent involvement. They think it's fantastic when I tell them about it, that they have access to all the content, all the assignments and all the feedback. (T14)

This was also discussed by three other teachers, who believe that the lack of parent interest is more about misunderstanding the approach, and that "initially it scares parents because it looks like what [teachers] are doing is not teaching" (T2):

> Well I don't think they're as aware of it as much as we'd like them to be. I don't think they're 100% aware of the idea of it but I think if they did have an understanding of it, they'll be 100% behind it. (T25)

One teacher received a complaint about the approach from a parent in the first term of a new Maths class, stating that their "teaching style didn't support her daughter" because she "didn't have a Maths textbook" (T6). The teacher immediately phoned the parent and explained how the flipped approach worked, after which time the parent was happy, and did not feel the need to "attend parent teacher interviews".

Students also agreed that, although there was some improvement throughout the year in the involvement and engagement of parents with their schooling as a result of FL (see Appendix F), the approach was not increasing transparency for their parents, with 'Parents can get more involved in my homework' also ranked 14th out of 14 FL advantages by Year 12s (see Appendix G). Likewise, in four out of the seven focus groups (FG), students reported that they did not talk to their parents at all about the flipped approach, with two of the focus groups bursting into laughter when it was suggested, and some remarking that "as long as [they did their] homework [their parents] don't care" (FG4). For one Year 12 student, it was the seamless way that his teacher integrated the flipped approach into the classroom that meant he felt he did not need to share with his parents:

> I feel like with such a minor change that we were so comfortable with, we didn't have the need to confront our parents about, we just migrated into it without much problem. (S7)

Students also reported talking to their parents about the approach in four of the seven focus groups, with two students saying that "it's not really like a big thing" (S64). One Year 7 student said that the only reason they talked to their mother about the approach, was due to concerns she had about what the student was doing on the internet due to using too much data. However, another Year 7 student found FL gave her time to sit down with her parents and work through problems together:

> I talked to my mum and my stepdad and they found it on the internet and they watched it... They said it was really good. My stepdad helped me to understand it... (S33)

Three Year 12 students also reported positive parent perceptions of the approach, including being impressed by the technology used to make the videos and the interactiveness of the approach. One student explained how her father was impressed by her teacher's commitment to providing flipped feedback on all assignments. This open and collaborative approach to doing homework together because of FL, echoes previous findings (e.g., Oyola, 2016; Collins, 2017), and was strongly recommended by parents in those studies.

Discussion

The results are discussed against the bioecological model of influences on student engagement (see Figure 2) developed by the author, based on student engagement literature, Bronfenbrenner and colleagues (Bronfenbrenner, 1979, 1986; Bronfenbrenner & Ceci, 1994), and Schwab (1973), in an attempt to identify recommendations for schools to successfully implement the FL approach.

Macrosystem

Increasing broadband access is particularly important to parent engagement (Hollingworth et al., 2011), however all participants referred to difficulties accessing the internet, as a result of their regional location, as well as the length of time that the National Broadband Network is taking to rollout across Australia (Alizadeh, 2017). Principals and teachers in particular lamented that "being able to maximise learning is restricted" (S2P), however it is vital that schools recognise that this is an ongoing issue and alter their policies accordingly, such as opening up computer labs to families (Lewin & Luckin, 2010).

Exosystem

Factors impacting on the implementation of FL at this level include the school BYOD policy, with a range of compatibility issues between devices or "outdated iPads, which means they can't upload stuff to Daymap…or airdrop" (T14), the lack of knowledge of FL that students from incoming feeder schools have, and school funding of PD, equipment, and staff. Whilst the increased number of teachers in middle and secondary school has been recognised as an inhibitor to parent engagement (Hill & Tyson, 2009), it is not uncommon in secondary schools to find teachers assigned to different classes not only from semester to semester, but also from term to term, which a number of participants in this study said impacts not only on teacher-student and teacher-parent relationships, but also on their ability to implement, try and refine new approaches. Schools are therefore encouraged to be cognizant of frequent and severe changes of staffing on ongoing PD and on family engagement. Feeder schools could also be included in parent engagement strategies (Goodall, 2016), by increasing the amount of support given to NLGs and strengthening learning opportunities between sites.

Mesosystem

Students' socio-economic background, including their location in a regional, farming community, impacts not only on the ability of families to afford devices, or that "they live so remote…that they rely on a dongle that has 10GB data [and are] sharing it amongst potentially 4 or 5 people", but also that "Mum and Dad have to do budgeting and look at farm yield" (T25). In their study of migrant parents' and teachers perceptions of parent engagement, Schneider and Arnot (2018) found that long shifts and travel time of parents who work in agriculture was a large factor in low levels of parent knowledge and engagement in student learning. However, it did not mean that their lack of involvement in homework

or attendance at parent/teacher interviews equated to a lack of interest, as assumed by many teachers in both that and the present study. Therefore, it is vital for schools to understand the barriers for families within their own context, by means of conducting a needs analysis, so as not to let assumptions impede upon healthy home-school relationships and communication (EEF, 2018; Goodall & Vorhaus, 2011). Offering students the opportunity to loan equipment out to take home (Hohlfeld et al., 2010) might also assist families who are unable to afford a device.

Microsystem

Schools need to adopt a whole school approach to parent engagement, in which school leaders should play a large part (Goodall & Vorhaus, 2011; Pushor & Amendt, 2018). The leaders in this study showed varying levels of knowledge and understanding of FL, parent engagement strategies being employed by staff, and the level of engagement of parents with FL. They also showed different levels of commitment to supporting staff development, with S1 staff feeling "pigeonholed" and "very restricted", not allowed to attend PD that would enhance their knowledge of using technology in the classroom as it was "not [their] area" (T6). There needs to be an increase in pre- and in-service teacher training to use technology and to understand how to work with parents as partners, as well as increased practitioner-based research, and for schools to evaluate the use of approaches like FL, and share findings with other schools (Axford, Lehtonen, Kaoukji, Tobin, & Berry, 2012; Bond, Zawacki-Richter, & Nichols, 2018; Pushor & Amendt, 2018). In an Australian study, leaders in schools with high parent engagement valued the voice of all school community members, built teacher capacity to engage parents with student learning, including through the use of technology (e.g., Facebook, ClassDojo), used multiple means of communication, and organised parent workshops in collaboration with parents and teachers on the use of a range of technology applications and tools (Willis et al., 2018). If there were combined parent/teacher PD sessions on FL, parents could work together with teachers to plan how to integrate and implement the new learning (Pushor & Amendt, 2018).

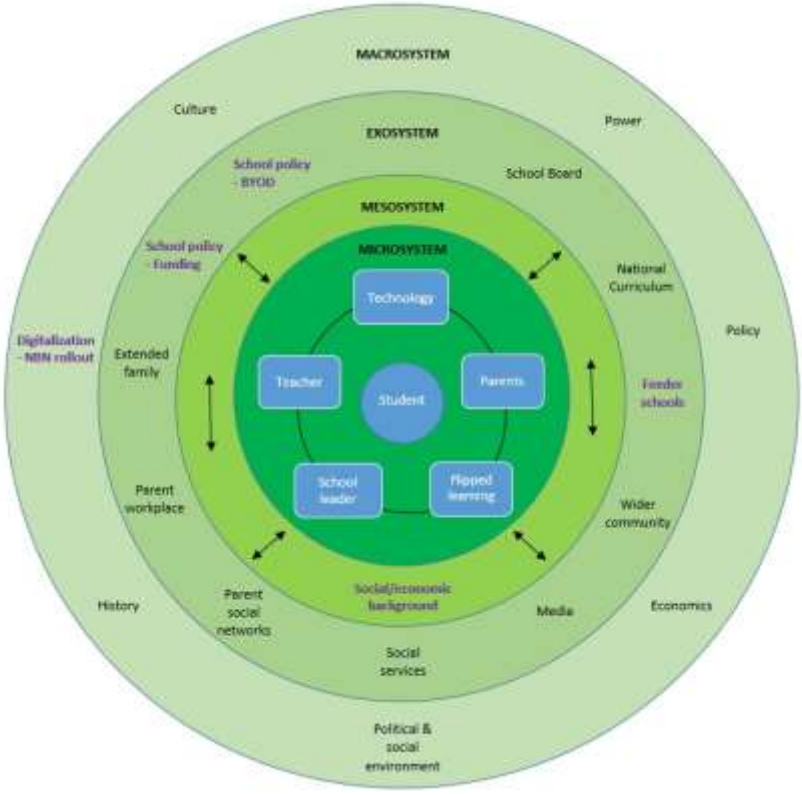

Figure 2 Bioecological model of influences on implementation of the flipped learning model

Increased guidance by parents can lead to greater understanding of homework requirements and opportunities for families to work together (Beaumont-Bates, 2017), such as when S33's stepdad sat with her to work out how to access her homework, and then helped her do it. Chen (2015) found that students who did not talk to their parents every day about their homework and school activities,

performed lower than those who did, and in a meta-analysis of parent involvement in homework, the average student whose parent had been trained to be involved with homework, had fewer problems completing their homework than 80% of students whose parents were not trained (Patall et al., 2008). Therefore, it is important that students are not only actively encouraged to stop "acting as gatekeepers" (Crozier & Davies, 2007, p. 304) and to openly share their FL work with their parents, but also that parents are taught how to actively engage with homework and FL platforms.

Conclusion, Limitations and Future Research

This case study examined school leader, parent, student and teacher perceptions of FL at two rural South Australian schools. All stakeholders agree that FL has a range of advantages and can affect student learning positively. However, the results reveal that there is a disconnect between what teachers and school leaders think parents know, and what they actually know and are engaged in. Whilst FL has the potential to positively affect parent engagement in student learning, it has yet to become embedded in school and home culture. This is one case study, and is therefore not necessarily generalisable; however, it does provide further insight into how various stakeholders perceive FL and how the approach can affect parent engagement. Unfortunately, parent participants did not want to or were not able to be interviewed, which would certainly have enriched the data. However, this has also been reported as an issue in a number of other studies seeking parent perceptions (e.g., D'addato & Miller, 2016). Whilst schools are recommended to engage more with research efforts, this also indicates that future studies need to take a more multipronged and comprehensive recruitment approach, including engaging Education Department representatives, mailing information directly to parents prior to the study commencing, and providing staff with graphs to document the study's progress in the school (Schilpzand et al., 2015). In order to extend the conversation on the potential of FL to enhance the connection between school and home, the next stage of this research is a deeper exploration of how FL affects student engagement, including classroom observations, as well as advantages and disadvantages of the approach, alongside student and teacher suggestions for how to use FL to engage students.

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