

Article

# Sustainable Teaching Strategies to Teach Indigenous Students: Their Relations to Students' Engaged Learning and Teachers' Self-Concept

Feifei Han 

Institute for Learning Sciences & Teacher Education, Australian Catholic University, Brisbane, QLD 4000, Australia; feifei.han@acu.edu.au

**Abstract:** To help Indigenous Australian students engage with academic work, educators and teachers alike need to understand what teaching strategies are beneficial for Indigenous students' learning. This study examines the predictions of the three types of Indigenous teaching strategies, namely, integrative teaching (integrating Indigenous perspectives in teaching), community linking (utilising Indigenous community input), and culture sharing (encouraging Indigenous students to share cultural values), to Indigenous students' engaged learning and teachers' self-concept in teaching. With 208 teachers surveyed from 52 Australian urban and rural primary schools, we found that culture sharing had positive contributions to Indigenous students' engaged learning, whereas integrative teaching and community linking positively predicted teachers' self-concept in Indigenous teaching. These differential patterns suggest useful strategies for enhancing student- or teacher-focused outcomes, respectively. How to successfully integrate these Indigenous teaching strategies is a key to successful teaching practice, as these strategies cannot only improve Indigenous students' engaged learning but, at the same time, may foster teachers' confidence in teaching Indigenous students.



**Citation:** Han, F. Sustainable Teaching Strategies to Teach Indigenous Students: Their Relations to Students' Engaged Learning and Teachers' Self-Concept. *Sustainability* **2022**, *14*, 10973. <https://doi.org/10.3390/su141710973>

Academic Editors: Muhammet Usak, Kamisah Osman, Milan Kubiатko and Cem Biro

Received: 21 May 2022

Accepted: 24 August 2022

Published: 2 September 2022

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2022 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

**Keywords:** Australian indigenous students; engaged learning; primary school teaching; teachers' self-concept; teaching strategies

## 1. Introduction

Despite centuries of attempts for improvement, many Indigenous peoples around the world still find themselves being continually marginalized [1]. In Australia, Indigenous populations have long been acknowledged as disadvantaged populations based on a range of indicators [2]; as they have been marginalized in many areas, including socio-economic, health, cultural, and educational aspects [3]. One possible sustainable way to improve the wellbeing and life opportunities of the Indigenous population is through education.

However, Indigenous Australian children are found to experience alienation from school, suffer from youth depression and suicide, and be unable to secure rewarding and productive careers [4]. For these mostly underachieving Australian children to catch up with their non-Indigenous counterparts, they need to actively engage in the process of learning. One important channel to achieve this aim is through quality teaching, as effective and productive instructional strategies are expected to enhance engagement in learning [5]. Good teaching strategies may also reinforce teachers' self-perceptions as good teachers [6], which in turn leads to positive teaching behaviours [7]. There is a paucity of empirical research that investigates the kinds of teaching strategies which may be effective for the teaching of Indigenous students [8,9]. This study attempts to empirically investigate the contributions of three Indigenous teaching strategies—integrative teaching, community linking, and culture sharing—on Indigenous Australian students' engaged learning perceived by teachers, and on teachers' self-concept in teaching. The findings will

help teachers to make wise decisions as to what Indigenous teaching strategies may be adopted in their teaching of Indigenous students.

## 2. Literature Review and Theoretical Framework

### 2.1. Indigenous Teaching Strategies

A continuing issue of Indigenous education in Australia is Indigenous students' low school attendance and retention rates [10]. Even in urban areas, Indigenous students' mean attendance rates were also consistently below non-Indigenous peers' attendance [11]. In 2018–2019, only around 66 per cent of Indigenous Australians had attained Year 12 or equivalent qualification [12]. Between 2018–2019, the Year 12 attainment gap between Indigenous and non-Indigenous Australians widened in all areas, except for major cities [12]. To address these issues of disadvantaged children in schools, one of the most critical aims for Indigenous education is to explicate successful teaching strategies to effectively engage Indigenous students so as to improve their educational outcomes.

In the literature relating to educational research, Hattie [13] (p. 236) listed teachers as the second influential factor, after students' individual factors, contributing to differences in students' outcomes, accounting for almost one third of the variance. Teachers are well known to 'make the difference in student learning' and are often named 'the major players' in education [14] (p. 22). Analysing the literacy and numeracy achievements of more than 13,700 Australian primary and secondary students, Hill and Rowe [15] found that the teacher factor accounts for as high as 45% and 55%, respectively, of variance in students' performance in literacy and numeracy, revealing once again the powerful teacher factor in promoting academic performance.

A variety of teacher factors have been identified to exert influences on students' academic learning, including teachers' qualification, years of teaching experience, teacher–student relationships, teaching efficacy, and teaching strategies [16–18]. In the present study, the focus is placed on teaching strategies as they are more easily modified and refined for better educational effects through continuing professional development. Good teaching strategies that are effective and productive play a vital role in both the process and the product of students' learning [19].

Whereas the universally endorsed teaching strategies are useful for a whole range of students with varying characteristics, the effects of culture-sensitive teaching strategies have not received much attention. In Australia, evaluation of the effects of teaching strategies which take into account of Indigenous culture and values in educating Indigenous students is lacking. In the present research, we examined the effects of three frequently used Indigenous teaching strategies by teachers in Australia, namely, integrative teaching, community linking, and culture sharing on Indigenous students' engaged learning and teachers' self-concept in Australian primary schools. The three types of Indigenous teaching strategies share similarity in that they all recognize the "indigeneity" in the context of teaching and use this to support students' learning. *Integrative teaching* utilises Indigenous culture, values, and perspectives, and incorporates them into the curriculum design. *Community linking* is a teaching strategy whereby local Indigenous communities are actively involved and consulted so that a sense of cultural belonging is nurtured in teaching. *Culture sharing* is used to empower Indigenous students to feel pride in and a sense of belonging to their culture. This teaching strategy attempts to create learning activities which encourage Indigenous students to share cultural values with students from non-Indigenous background in class. According to previous research, when teaching is designed to incorporate Indigenous students' values and when new knowledge is delivered in a way that is culturally appropriate, Indigenous students tend to learn better [20]. Hence, we may envisage that these teaching strategies are beneficial to engage Indigenous students in learning.

## 2.2. Indigenous Students' Engaged Learning

Engaged learning is a multidimensional construct, encompassing engagement in at least three aspects, namely behaviour, cognition, and emotion [21]. Wang et al. [22] describe behavioural engagement as effort and persistence displayed by students in learning; cognitive engagement as students' strategic behaviours of deploying cognitive and metacognitive strategies in learning; and emotional engagement as students' enjoyment, values, and affect in learning. Research often concentrates on one aspect of engagement at a time [23]. In the present study, we focused on students' engaged learning in the behavioural aspect, as behaviours are observable by teachers. Hence, this is considered being appropriate if we aimed to involve teachers' voices in the process of investigation. In our study, we did not use the normal practice for measuring engaged learning by students' self-reported data because: (1) students were in primary schools, so they might not be able to accurately reflect their engagement in learning; and (2) teachers' perceptions of engaged learning provide a new perspective, which tends to be closely related to how they may adjust teaching behaviours from their observed students' engaged learning.

How to engage students in learning is arguably critical in teaching, because engaged students are likely to show superior performance on assignments, obtain high exams scores, and display high quality critical thinking skills [24]. They also tend to develop positive affect, disposition, and belonging at schools [25]. Empirical research has provided evidence of positive influence of some kinds of teacher behaviours on engaged learning. From a self-determination perspective, fostering relevance in teaching has been shown to be one of the most influential teaching methods that provides a higher level of engaged learning [26].

Extending this finding in general teaching to teaching Indigenous students, we may expect that the way teachers draw Indigenous culture-relevant materials to facilitate Indigenous students' learning. The use of community resources (i.e., integrative teaching) and bringing in Indigenous people to work with the teacher (i.e., community linking) may create an environment for Indigenous students to sense relevance from teaching to learning. Fostering relevance may also be realized by inviting Indigenous students' to actively share their own personal knowledge and experiences of their communities to classmates (i.e., culture sharing). This kind of teaching strategy with students' active participation may better cultivate their sense of relevance, leading to better engaged learning.

## 2.3. Teachers' Self-Concept in Teaching

Self-concept has been described as a construct that can enable 'the realization of full human potential in a range of settings' [27] (p. 134). This widely researched construct has been shown to be beneficial in generating happiness and maintaining adaptive functions [28], and in reducing anxiety and increasing resilience after failure [29]. Extensive research has produced consistent results showing that students' positive academic self-concept can make students feel good about themselves and can enhance their behaviour and performance in learning [30]. However, regarding teachers' self-concept of teaching there is comparatively less research. Based on self-concept research in a wide range of areas, it is important to develop a positive self-concept, as this may promote motivation and foster confidence, and nurture teachers' psychological wellbeing [31].

The structure of self-concept is well known as being domain specific [32]. Marsh [33] found distinct self-concepts in a large variety of school subjects, such as verbal, math, physical, art, music, and religion. As self-concept is a domain-specific construct, we propose that self-concept in teaching should also be domain specific. Therefore, we made a distinction between self-concepts in general teaching and self-concept in Indigenous teaching. Based on the strong evidence showing domain-specific relations between self-concepts and outcomes in matching domains [30], we envisage that Indigenous-focused teaching strategies are more likely to influence teachers' self-concept in Indigenous teaching than self-concept in general teaching.

#### 2.4. The Current Investigation

The current investigation adopted a quantitative method by using close-ended questionnaire to ask primary school teachers in Australia to rate how frequently they used the three popular Indigenous teaching strategies, namely, integrative teaching, community linking, and culture sharing, in their teaching. It examined how these teaching strategies predicted (1) Indigenous students' engaged learning (perceived by teachers), (2) self-concept in Indigenous teaching and self-concept in general teaching. Specifically, two research questions were addressed in the study:

1. How do the three Indigenous teaching strategies predict Indigenous students' engaged learning as perceived by their teachers?
2. How do the three Indigenous teaching strategies predict teachers' self-concept in Indigenous teaching and general teaching?

From the literature, the following two hypotheses were formulated, which were tested using structural equation modelling (SEM):

**Hypothesis 1.** *The three types of Indigenous teaching strategies would be positively related to Indigenous students' engaged learning. However, the three teaching strategies would predict Indigenous students' engaged learning differently.*

**Hypothesis 2.** *All the three Indigenous teaching strategies would be positively associated with self-concept in Indigenous teaching, but the three strategies might not necessarily have any influence on self-concept in general teaching, considering the domain-specific nature of the self-concept [33,34].*

### 3. Methodology

#### 3.1. Participants

The participants were 208 (45 males and 163 females) teachers recruited from 52 primary schools in Australia. As identified in a database, all the 52 primary schools had high enrolment rates of Indigenous students. All the participants had teaching qualifications, ranging from Graduate Diploma in Education to Bachelor of Education or Bachelor of Teaching. Ethics requirements were strictly followed, and the written consent was obtained from all the participants to indicate their willingness to participate in the study on a voluntary basis.

#### 3.2. Materials

Data were collected through a questionnaire, which was specifically designed to capture the frequency of using the three Indigenous teaching strategies, self-concept in Indigenous teaching, self-concept in general teaching, and perceptions of Indigenous students' engaged learning. All the scales were on 5-point Likert scales. The anchors of the Indigenous teaching strategies were from 1, representing "not at all", to 5, indicating "highly frequently". For the rest of the scales, 1 represented "strongly disagree", and 5 suggested "strongly agree". The details of the questionnaire are explained below.

##### 3.2.1. Indigenous Teaching Strategies

Indigenous teaching strategy items asked teachers to rate how frequently they used three Indigenous teaching strategies to teach Indigenous students. The three Indigenous teaching strategies are frequently used by Australia teachers. For each teaching strategy, three items were used. The items of integrative teaching described teaching as incorporating Indigenous cultures and perspectives in the curricula design and classroom teaching practice. The items of community linking described teaching as contacting Indigenous communities to discuss, obtain opinions, and learn Indigenous ways about things. The items of culture sharing described teaching as encouraging Indigenous students to share their cultural values with non-Indigenous classmates. The reliability of the scales and the sample items of each scale are presented in Table 1.

**Table 1.** Reliability and sample items of the scales.

Scales (Alpha)	Sample Items
integrative teaching ( $\alpha = 0.71$ )	I have taught my current students about Aboriginal Australia using appropriate resources.
community linking ( $\alpha = 0.82$ )	I invite Aboriginal people from our community to teach us Aboriginal ways of knowing, thinking, and learning about things.
culture sharing ( $\alpha = 0.77$ )	I provide an environment where the Aboriginal children in my class are confident to share their knowledge about Aboriginal people and cultures.
teachers' self-concept in Indigenous teaching ( $\alpha = 0.75$ )	I understand the educational rationale for teaching Aboriginal perspectives across the curriculum to my students.
teachers' self-concept in general teaching ( $\alpha = 0.82$ )	I am good at teaching most subjects that I teach.
Indigenous students' engaged learning ( $\alpha = 0.86$ )	My Aboriginal students participate when we discuss things in class.

### 3.2.2. Indigenous Students' Engaged Learning

Four items were used to ask teachers' perceptions of their Indigenous students' engaged learning as reflected by typical learning behaviours, including responding to questions, participating in discussions, taking part in group work, and getting involved in other classroom activities.

The data collection strictly followed the procedures approved by the ethics committee of the researchers' university. The packages of the paper questionnaires were sent to 52 primary schools by mail. The response rate was 40%.

### 3.2.3. Self-Concept in Indigenous Teaching

This scale was specifically designed using the format of the scale used in [27] to capture teachers' self-concept in Indigenous teaching. It consisted of five items, which asked how confident and effective the teachers perceived themselves with regard to teaching Indigenous students, including supporting Indigenous students, creating culturally informed assessments for them, applying culturally appropriate classroom management strategies, and understanding principles of teaching Indigenous students.

### 3.2.4. Self-Concept in General Teaching

Additionally, using the format of the scale in [27], the scale of self-concept in general teaching also had five items, which measured how teachers perceived their general teaching competence, classroom management ability, and learning environment maintenance.

## 3.3. Data Analysis

The data analyses were conducted in three stages. The first stage used exploratory factor analysis (EFA) to explore the structure of the scales used in the questionnaire using a principal component procedure. The EFA commenced with checking the correlation matrix was checked, and the items whose majority of significance values were greater than 0.05 were excluded since these items showed only few correlations with other items, thus violating the assumption of performing an EFA [35]. Then, the items whose coefficients were  $<0.50$  within a factor, and the items with high multiple coefficients loaded across factors were also deleted [35]. This stage served as a preliminary examination of the factor structure of this customarily designed instrument.

The second stage involved conducting confirmatory factor analysis (CFA) of the factor solution resulted from the EFA. The last stage tested the hypothesized predictions from the three Indigenous teaching strategy scales (integrative teaching, community linking, and culture sharing) to the three outcome variables (self-concept in Indigenous teaching and

self-concept in general teaching, and Indigenous students' engaged learning) using a SEM with Mplus 8 software.

We followed the procedures for conducting CFA and SEM recommended in [36,37]. We used a range of goodness-of-fit statistics to evaluate CFAs and SEM because of the sensitiveness of chi-square statistics to sample size. The Tucker–Lewis Index (TLI, [38]), the Comparative Fit Index (CFI, [39]), and the root mean square error of approximation (RMSEA, [40]) were consulted. We followed a number of suggestions for acceptable values of fit to the data [40,41]: values of TLI and CFI > 0.90, and a value < 0.08 for RMSEA.

## 4. Results

### 4.1. Results of EFAs and CFAs

EFA using all 23 items yielded six factors with acceptable loadings (all above 0.40) of items on their respective factors, and the six factors explained 52.57% of the total variance.

A single-factor CFA in which all the 23 items represented a single factor did not produce an acceptable fit:  $\chi^2(224) = 423.59$ , TLI = 0.90, CFI = 0.89, RMSEA = 0.07; however, a six-factor CFA in which the 23 items represented three factors of Indigenous teaching strategies, two factors of self-concept, and one factor of Indigenous students' engaged learning resulted in a proper solution with a good fit:  $\chi^2(215) = 352.41$ , TLI = 0.93, CFI = 0.92, RMSEA = 0.06. The factor loadings for the items on each scale were all above 0.55.

As shown in Table 2, the latent correlations ranged from 0.02 to 0.56, indicating that the six scales were distinct from each other. Among the three Indigenous teaching strategies, the integrative teaching strategy had significant and positive correlations with the community linking strategy ( $r = 0.46$ ) and the culture sharing strategy ( $r = 0.16$ ), whereas it did not significantly associate with the culture sharing strategy ( $r = 0.02$ ). These results suggest that teachers who used integrative teaching strategies were also more likely to implement the community linking strategies as well as the culture sharing strategies; however, using community linking strategies did not go hand in hand with using culture sharing strategies.

The integrative teaching strategy ( $r = 0.24$ ) and the culture sharing strategy ( $r = 0.26$ ) were positively and significantly related to the engaged learning strategy, but the correlation between the community linking strategy and the engaged learning strategy was not significant ( $r = 0.11$ ). All the three strategies were positively and significantly associated with the self-concept in Indigenous teaching (the integrative teaching strategy:  $r = 0.56$ ; the community linking strategy:  $r = 0.55$ ; the culture sharing strategy:  $r = 0.21$ ). The correlations between self-concept in general teaching was only significantly and positively associated with the integrative teaching strategy ( $r = 0.17$ ) and the culture sharing strategy ( $r = 0.43$ ), but not with the community linking strategy ( $r = 0.13$ ). Indigenous students' engaged learning significantly and positively correlated with both self-concept in Indigenous teaching ( $r = 0.25$ ) and self-concept in general teaching ( $r = 0.34$ ).

### 4.2. Results of the SEM

We used the latent variables established in the six-factor CFA to construct a SEM, which examined the relative predictions of the three Indigenous teaching strategies to the three outcomes, namely, self-concept in Indigenous teaching, self-concept in general teaching, and Indigenous students' engaged learning. The goodness-of-fit of this model was identical to the six-factor CFA model:  $\chi^2(215) = 352.41$ , TLI = 0.93, CFI = 0.92, RMSEA = 0.06. The paths in the model are displayed in Table 3 and visualized in Figure 1.

Table 3 reveals that the integrative teaching strategy had a significantly positive path to the self-concept in Indigenous teaching ( $\beta = 0.49$ ), but a non-significant path to the Indigenous students' engaged learning ( $\beta = 0.04$ ). Likewise, the community linking strategy had a significant and positive path to the self-concept in Indigenous teaching ( $\beta = 0.32$ ), but a non-significant path to the Indigenous students' engaged learning ( $\beta = -0.20$ ). Different from the above patterns, the path of the culture sharing strategy to self-concept in Indigenous teaching was non-significant ( $\beta = 0.06$ ), whereas the path from the culture sharing strategy to the Indigenous students' engaged learning was statistically significant and substantial

( $\beta = 0.66$ ). All the three types of teaching strategies had non-significant paths to self-concept in general teaching (the integrative teaching strategy:  $\beta = 0.09$ ; the community linking strategy:  $\beta = 0.01$ ; the culture sharing strategy:  $\beta = 0.20$ ). The different values of  $\beta$ s from the three teaching strategies to self-concept in Indigenous teaching and to self-concept in general teaching demonstrated the domain specificity of the self-concept construct.

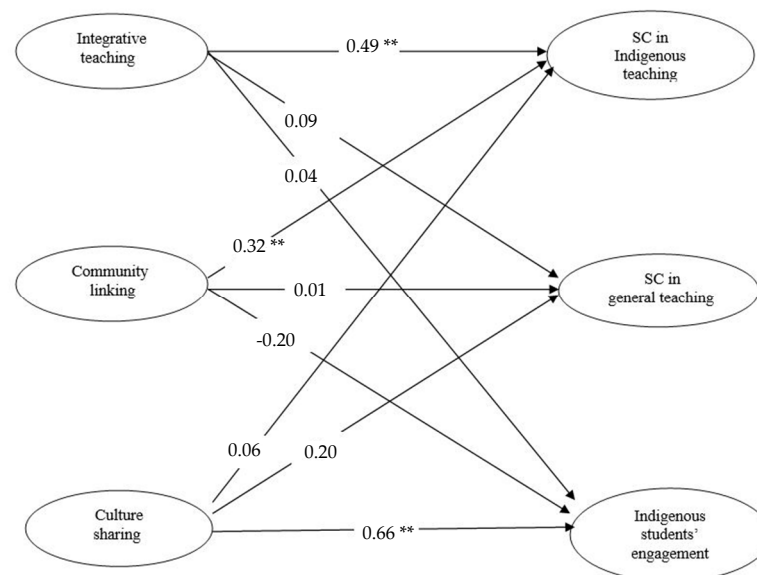
Table 2. Solution of the CFA.

	Integrative	Community	Culture	SCI	SCG	Engagement
Mean	4.07	2.47	4.23	3.72	4.48	4.45
SD	0.72	0.96	0.44	0.69	0.45	0.59
integrative1	0.76 *					
integrative2	0.62 *					
integrative3	0.60 *					
community1		0.71 *				
community2		0.69 *				
community3		0.72 *				
culture1			0.70 *			
culture2			0.76 *			
culture3			0.71 *			
engagement1				0.66 *		
engagement2				0.84 *		
engagement3				0.87 *		
engagement4				0.75 *		
SCI1					0.71 *	
SCI2					0.85 *	
SCI3					0.78 *	
SCI4					0.66 *	
SCI5					0.78 *	
SCG1						0.74 *
SCG2						0.71 *
SCG3						0.66 *
SCG4						0.58 *
SCG5						0.73 *
integrative	–					
community	0.46 *	–				
culture	0.16 *	0.02	–			
engagement	0.24 *	0.11	0.26 *	–		
SCI	0.56 *	0.55 *	0.21 *	0.25 *	–	
SCG	0.17 *	0.13	0.43 *	0.34 *	0.39 *	–

Notes: \*  $p < 0.05$ . Integrative = the integrative teaching strategies; community = the community linking strategies; culture = the culture sharing strategies; SCI = self-concept in Indigenous teaching; SCG = self-concept in general teaching; engagement = Indigenous students’ engaged learning.

Table 3. Estimates of the SEM.

Exploratory Variables		Endogenous Variables	Standardized $\beta$	$p$
integrative teaching	→	teachers’ self-concept in Indigenous teaching	0.49	0.00
community linking	→		0.32	0.00
culture sharing	→		0.06	0.52
integrative teaching	→	teachers’ self-concept in general teaching	0.09	0.57
community linking	→		0.01	0.10
culture sharing	→		0.20	0.93
integrative teaching	→	Indigenous students’ engaged learning	0.04	0.80
community linking	→		−0.20	0.08
culture sharing	→		0.66	0.00



**Figure 1.** Indigenous teaching strategies to student engaged learning and teachers' self-concept (\*\*  $p < 0.01$ ).

## 5. Discussion

The present study examined how three types of Indigenous teaching strategies, namely, integrative teaching strategies, community linking strategies, and culture sharing strategies, are related to Indigenous students' engaged learning and teachers' self-concepts. The analysis found that the teaching strategies predicted students' engaged learning and teachers' self-concepts differently.

For research question 1, our results did not support the first hypothesis, as community linking strategies did not correlate with Indigenous students' engaged learning. Of the other two Indigenous teaching strategies, only culture sharing strategies significantly and positively predicted Indigenous students' engaged learning. A possible explanation of the non-significant contributions from integrative teaching and community linking strategies but significant contribution from culture sharing strategy could be that the two former strategies are more teacher-centred teaching strategies, whereas culture sharing is more student-centred teaching strategy as culture sharing was about helping Indigenous students to be confident to share their own cultures with their classrooms. Therefore, those more teacher-centred teaching strategies were positive predictors to teachers' self-concept in Indigenous teaching but not to students' engaged learning.

Research has shown that teachers who favour teacher-centred teaching strategies tend to conceive teaching primarily as knowledge transmitting whereas those who prefer student-centred strategies tend to conceive teaching as changing students' concepts [42]. In our study, those who favoured adopting integrative teaching and community linking strategies would consider the ability of controlling teaching processes as a pre-requisite for successful knowledge transmitting, and use of the two strategies might make them feel competent in handling teaching (positive self-concept in Indigenous teaching). In contrast, those who adopted culture sharing strategy more frequently might hold a belief of teaching as a process helping students' conceptual change, and thus, those teachers might prioritize engaging students as their main objectives of teaching.

The correlation results between the three teaching strategies might also support the speculation of the different foci of the three strategies, as culture sharing strategy was either only weakly associated with integrative teaching strategy ( $r = 0.16$ ) or was non-significantly related to community linking strategy ( $r = 0.02$ ). However, the association between integrative teaching strategy and community linking strategy was moderate ( $r = 0.46$ ). These correlation results indicate that teachers who tended to use community



linking strategy seem not to apply culture sharing strategy. However, the community linking strategy tended to go hand in hand with integrative teaching strategy. The contrasting foci in the objectives of teaching between student-centred teaching and teacher-centred teaching strategies [42] were perhaps the reason of the correlational patterns between these three Indigenous teaching strategies. However, in order to confirm this speculation, future research may also interview teachers about their conceptions of teaching.

For research question 2, the results showed that integrative teaching and community linking, but not culture sharing, were positively predicted self-concept in Indigenous teaching. None of the three Indigenous teaching strategies significantly predicted self-concept in general teaching. These results largely confirmed the second hypothesis and demonstrated the domain specificity of self-concept in teaching [33,34]. This strong domain-specific predictive pattern is expected, as numerous empirical studies have provided evidence for the domain-specific relations of self-concept and outcome variables in the matching domains [32]. Although all the three Indigenous teaching strategies were significantly and positively related to the self-concept in Indigenous teaching, only two of them (i.e., integrative teaching and community linking strategies) had significant and positive paths to the self-concept in Indigenous teaching when putting the three strategies into a single model. This finding implies that when the three strategies are considered together, the culture sharing teaching strategy tends to be the weakest contributing factor to Indigenous teaching self-concept. This means that fostering positive self-perceptions in Indigenous teaching abilities would benefit more from adopting integrative teaching and community linking strategies. Such a finding is understandable, as compared to integrative teaching and community linking, in which teachers play a more central role, culture sharing is more of a student-oriented teaching strategy. Teachers may only function as a facilitator for Indigenous students to introduce their culture and values to the rest of the class. For the other two strategies, on the other hand, teachers play more of a central role and serve as an active agent promoting learning, and hence, teachers are more likely to sense a higher level of teaching competence. Our findings indicate that effective teaching strategies are not only beneficial to students' learning, as indicated in the literature [5], but also contribute to the positive psychological well-being of teachers as reflected by positive self-concept. This finding is in line with self-concept research which shows that perceptions of self and behaviours in matching domains are mutually reinforcing each other [32].

### 5.1. Practical Implications

The findings of our study have significant practical implications for Indigenous teaching practices and teacher education. Firstly, our results suggest that by encouraging teachers to use integrative teaching and community linking strategies, they may appreciate their competence in teaching Indigenous students, resulting in a higher level of self-perceptions of the competence in teaching Indigenous students. As self-concept is well acknowledged as a positive factor to benefit subsequent performance and behaviours [43], these two teaching strategies should be strengthened in teacher education. A positive self-concept of Indigenous teaching may in turn lead to other beneficial Indigenous teaching behaviours. However, these mutually reinforcing relationships between Indigenous teaching strategies and Indigenous teaching self-concepts require a longitudinal design to testify in future studies. Through verifications of these relations longitudinally, a repertoire of effective and sustainable Indigenous teaching strategies may be developed and used in the future.

Secondly, the Indigenous teaching strategies examined in the present study need to be promoted and encouraged in the Australian teaching context, or in teaching contexts involving Indigenous populations in other parts of the world. For pre-service teachers in Australia, teacher education should incorporate courses related to Indigenous issues so that they can recognize the educational disadvantages Indigenous children experience in schools and beyond and are prepared to address these problems in their future teaching. Because preservice teachers are often not well-equipped with essential knowledge about effective

ways to teach Indigenous students [4], formal teacher education should integrate effective instructional practices that suit Indigenous learners into teacher education curricula.

Thirdly, our findings indicate that culture sharing emerged as a predictor of students' engaged learning. In real practice, teachers may consider organising special events for Indigenous students to celebrate their festivals with the other students in class. They may ask Indigenous students to share their understanding of an issue from Indigenous perspectives when introducing a new concept in class.

### 5.2. Limitations

In spite of the informative findings and practical contributions made by the present study, we also need to point out the limitations of our study. A major limitation of our study is that the measurement of students' engaged learning, which departed from a teachers' perspective. The reason for using such a measurement was the young age of the students, who might not be able to make accurate judgement about their engaged learning accurately. However, there could be discrepancies between teachers' perceptions of what counted as engaged learning and students' own evaluation of the engaged learning. Future studies should address this limitation by adding an instrument to measure students' own evaluation of their engaged learning in order to triangulate the evaluations from teachers' perspective. Furthermore, the study did not examine teachers' conceptions of Indigenous teaching, which might influence their choice of using Indigenous teaching strategies, as previous studies have reported close relations between teachers' conceptions of teaching and their teaching practice [44,45]. Thirdly, the current study only examined three types of Indigenous teaching strategies, which might not cover all the Indigenous teaching strategies adopted by teachers. Future studies may design some open-ended questionnaires for teachers to report the Indigenous teaching strategies, which are not covered by the survey.

## 6. Conclusions

Our study has provided empirical evidence on the predictions of three Indigenous teaching strategies to teachers' self-concept in Indigenous teaching and Indigenous students' engaged learning in Australian primary schools from a teachers' perspective. The most important finding of this quantitative modelling is that different Indigenous teaching strategies which distinguished by student or teacher-centred contributed differently to the outcomes in terms of students' learning and teachers' teaching. The more student-centred teaching strategy (i.e., culture sharing strategy) would be advantageous for enhance Indigenous students' engaged learning, whereas the Indigenous teaching strategies which are more teacher-centred (integrative teaching and community linking strategies) would be beneficial in terms of fostering positive teachers' confidence and self-concept in Indigenous teaching. Our results are largely consistent with previous investigations which found that integrating Indigenous cultures into pedagogy contributes to successful and quality teaching in teaching Australian Indigenous students [46–48].

**Funding:** This research was partially funded by [University of Hradec Králové], grant number [CZ.02.2.69/0.0/0.0/18\_053/0017841].

**Institutional Review Board Statement:** The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of University of Western Sydney (12826).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to ethical requirements.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Matheson, K.; Foster, M.D.; Bombay, A.; McQuaid, R.J.; Anisman, H. Traumatic Experiences, Perceived Discrimination, and Psychological Distress Among Members of Various Socially Marginalized Groups. *Front. Psychol.* **2019**, *10*, 416. [[CrossRef](#)] [[PubMed](#)]
2. Dockery, A. Inter-generational transmission of Indigenous culture and children's wellbeing: Evidence from Australia. *Int. J. Intercult. Relat.* **2020**, *74*, 80–93. [[CrossRef](#)]
3. Cobb-Clark, D.A.; Kettlewell, N.; Schurer, S.; Silburn, S. The Effect of Quarantining Welfare on School Attendance in Indigenous Communities. *J. Hum. Resour.* **2021**. [[CrossRef](#)]
4. Dillon, A.; Craven, R.G.; Kaur, G.; Yeung, A.S. Support for Aboriginal and non-Aboriginal Australian students' wellbeing at school. *Int. J. Educ. Res.* **2019**, *99*, 101520. [[CrossRef](#)]
5. Hattie, J.; Anderman, E. *International Guide to Student Achievement*; Routledge: New York, NY, USA, 2019.
6. Lee, M.; Tsai, C. Exploring teachers' perceived self efficacy and technological pedagogical content knowledge with respect to educational use of the world wide web. *Instr. Sci.* **2010**, *38*, 1–21. [[CrossRef](#)]
7. Sorge, S.; Keller, M.M.; Neumann, K.; Möller, J. Investigating the relationship between pre-service physics teachers' professional knowledge, self-concept, and interest. *J. Res. Sci. Teach.* **2019**, *56*, 937–955. [[CrossRef](#)]
8. Dzamesi, F.E.; Van Heerden, J. A professional development programme for implementing indigenous play-based pedagogy in kindergartens in Ghana. *S. Afr. J. Educ.* **2020**, *40*. [[CrossRef](#)]
9. Nkopodi, N.; University of South Africa; Mosimege, M. North-West University Incorporating the indigenous game of morabaraba in the learning of mathematics. *S. Afr. J. Educ.* **2009**, *29*, 377–392. [[CrossRef](#)]
10. Claremont, Y. Cultural Diversity in Higher Education Australia: International Students from Asia. *Int. J. Learn.* **2008**, *15*, 89–93. [[CrossRef](#)]
11. Baxter, L.P.; Meyers, N.M. Indigenous students attendance at one Australian urban primary school 2005–2015: A case study. *Aust. J. Educ.* **2019**, *63*, 22–43. [[CrossRef](#)]
12. Commonwealth of Australia. *Closing the Gap Report 2020*; Department of the Prime Minister and Cabinet: Canberra, Australia, 2020.
13. Hattie, J. *Visible Learning for Teachers: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*; Routledge: New York, NY, USA, 2009.
14. Hattie, J. *Visible Learning for Teachers: Maximizing Impact on Learning*; Routledge: New York, NY, USA, 2012.
15. Hill, P.; Rowe, K. Modeling student progress in studies of educational effectiveness. *Sch. Eff. Sch. Improv.* **1998**, *9*, 310–333. [[CrossRef](#)]
16. Kim, K.; Seo, E. The relationship between teacher efficacy and students' academic achievement: A meta-analysis. *Soc. Behav. Personal. Int. J.* **2018**, *46*, 529–540. [[CrossRef](#)]
17. Roorda, D.L.; Jak, S.; Zee, M.; Oort, F.J.; Koomen, H.M.Y. Affective Teacher–Student Relationships and Students' Engagement and Achievement: A Meta-Analytic Update and Test of the Mediating Role of Engagement. *Sch. Psychol. Rev.* **2017**, *46*, 239–261. [[CrossRef](#)]
18. Yu, R.; Singh, K. Teacher support, instructional practices, student motivation, and mathematics achievement in high school. *J. Educ. Res.* **2016**, *111*, 81–94. [[CrossRef](#)]
19. Orlich, D.; Harder, R.; Callahan, R.; Trevisan, M.; Brown, A. *Teaching Strategies: A Guide to Better Instruction*; Houghton Mifflin: Boston, MA, USA, 2012.
20. Gitari, W. Everyday objects of learning about health and healing and implications for science education. *J. Res. Sci. Teach.* **2005**, *43*, 172–193. [[CrossRef](#)]
21. Fredricks, J. Engagement in School and Out-of-School Contexts: A Multidimensional View of Engagement. *Theory Into Pr.* **2011**, *50*, 327–335. [[CrossRef](#)]
22. Wang, M.-T.; Fredricks, J.; Ye, F.; Hofkens, T.; Linn, J.S. Conceptualization and Assessment of Adolescents' Engagement and Disengagement in School. *Eur. J. Psychol. Assess.* **2019**, *35*, 592–606. [[CrossRef](#)]
23. Skinner, E.A.; Belmont, M.J. Motivation in the Classroom: Reciprocal Effect of Teacher Behaviour and Student Engagement across the School Year. *J. Educ. Psychol.* **1993**, *85*, 571–581. [[CrossRef](#)]
24. Lei, H.; Cui, Y.; Zhou, W. Relationships between student engagement and academic achievement: A meta-analysis. *Soc. Behav. Pers. Int. J.* **2018**, *46*, 517–528. [[CrossRef](#)]
25. Bertacco, L. Student engagement: Fostering a sense of belonging. *Engl. Aust. J.* **2020**, *36*, 54–59.
26. Assor, A.; Kaplan, H.; Roth, G. Choice is good but relevance is excellent: Autonomy-enhancing and suppressing teacher behaviours predicting students' engagement in schoolwork. *Br. J. Educ. Psychol.* **2002**, *72*, 261–278. [[CrossRef](#)] [[PubMed](#)]
27. Marsh, H.; Craven, R. Reciprocal effects of self-concept and performance from a multidimensional perspective: Beyond seductive pleasure and unidimensional perspective. *Perspect. Psychol. Sci.* **2006**, *1*, 133–163. [[CrossRef](#)] [[PubMed](#)]
28. Anthony, V.J.; Mol, S.N. The effect of self-concept on resilience and happiness among the undergraduate hostellers and day-scholars. *Int. J. Indian Psychol.* **2017**, *51*, 16–23. [[CrossRef](#)]
29. Jaureguizar, J.; Garaigordobil, M.; Bernaras, E. Self-concept, Social Skills, and Resilience as Moderators of the Relationship Between Stress and Childhood Depression. *Sch. Ment. Health* **2018**, *10*, 488–499. [[CrossRef](#)]
30. Möller, J.; Zitzmann, S.; Helm, F.; Machts, N.; Wolff, F. A meta-analysis of relations between achievement and self-concept. *Rev. Educ. Res.* **2020**, *90*, 376–419. [[CrossRef](#)]

31. McInerney, D.; Korpershoek, H.; Wang, H.; Morin, A.J. Teachers' occupational attributes and their psychological wellbeing, job satisfaction, occupational self-concept and quitting intentions. *Teach. Teach. Educ.* **2018**, *71*, 145–158. [[CrossRef](#)]
32. Wolff, F.; Sticca, F.; Niepel, C.; Götz, T.; Van Damme, J.; Möller, J. The reciprocal 2I/E model: An investigation of mutual relations between achievement and self-concept levels and changes in the math and verbal domain across three countries. *J. Educ. Psychol.* **2021**, *113*, 1529–1549. [[CrossRef](#)]
33. Marsh, H. A multidimensional hierarchical model of self-concept: Theoretical and empirical justification. *Educ. Psychol. Rev.* **1990**, *22*, 77–172. [[CrossRef](#)]
34. Lohbeck, A.; Frenzel, A. Latent motivation profiles for choosing teaching as a career: How are they linked to self-concept concerning teaching subjects and emotions during teacher education training? *Br. J. Educ. Psychol.* **2022**, *92*, 37–58. [[CrossRef](#)]
35. Field, A. *Discovering Statistics Using SPSS: And Sex and Drugs and Rock 'N' Roll*; Sage: Los Angeles, CA, USA, 2013.
36. Kline, R. *Principles and Practices of Structural Equation Modelling*; Guilford: New York, NY, USA, 2005.
37. Jöreskog, K.; Sörbom, D. *LISREL 8.72: Structural Equation Modelling with SIMPLIS Command Language*; Scientific Software International: Chicago, IL, USA, 2005.
38. Tucker, L.R.; Lewis, C. A reliability coefficient for maximum likelihood factor analysis. *Psychometrika* **1973**, *38*, 1–10. [[CrossRef](#)]
39. Bentler, P.M. Comparative fit indexes in structural models. *Psychol. Bull.* **1990**, *107*, 238–246. [[CrossRef](#)] [[PubMed](#)]
40. Browne, M.W.; Cudeck, R. Alternative ways of assessing model fit. In *Testing Structural Equation Models*; Bollen, K., Long, J., Eds.; Sage: Beverly Hills, CA, USA, 1993. [[CrossRef](#)]
41. Hu, L.; Bentler, P. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Model.* **1999**, *6*, 1–55. [[CrossRef](#)]
42. Trigwell, K.; Prosser, M. *Exploring University Teaching and Learning: Experience and Context*; Palgrave Macmillan: London, UK, 2020.
43. Prehn, J.; Peacock, H.; Guerzoni, M. Academic self-concepts of Aboriginal and/or Torres Strait Islander children from the Longitudinal Study of Indigenous Children. *Aust. J. Indig. Educ.* **2020**, *50*, 186–195. [[CrossRef](#)]
44. Alt, D. Science teachers' conceptions of teaching and learning, ICT efficacy, ICT professional development and ICT practices enacted in their classrooms. *Teach. Teach. Educ.* **2018**, *73*, 141–150. [[CrossRef](#)]
45. Lam, B.H.; Kember, D. The relationship between conceptions of teaching and approaches to teaching. *Teach. Teach. Theory Pract.* **2006**, *12*, 693–713. [[CrossRef](#)]
46. Burgess, C.; Tennent, C.; Vass, G.; Guenther, J.; Lowe, K.; Moodie, N. A systematic review of pedagogies that support, engage and improve the educational outcomes of Aboriginal students. *Aust. Educ. Res.* **2019**, *46*, 297–318. [[CrossRef](#)]
47. Harrison, N.; Greenfield, M. Relationship to place: Positioning Aboriginal knowledge and perspectives in classroom pedagogies. *Crit. Stud. Educ.* **2011**, *52*, 65–76. [[CrossRef](#)]
48. Yunkaporta, T.; Kirby, M. Yarning up Aboriginal pedagogies: A dialogue about eight Aboriginal ways of learning. In *Two Way Teaching and Learning: Toward Culturally Reflective and Relevant Education*; Purdie, N., Milgate, G., Bell, H., Eds.; ACER Press: Melbourne, Australia, 2011; pp. 205–213.