



# Children with learning difficulties and the move to Innovative Learning Environments

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## Abstract

*This paper discusses the perceptions of 283 New Zealand primary school principals and teachers about flexible learning spaces (Innovative Learning Environments), and the changes in pedagogical practices and classroom environments that these lead to, particularly in regard to outcomes in reading, writing and mathematics. Statements were general to all learners, but focused on struggling learners (students with learning difficulties), and targeted primary school educators given the importance of early learning for acquiring literacy and mathematics. An online questionnaire was distributed to both teachers and principals given their different influences on learning environments, management and teaching practices/interactions. Results indicated generally positive views of flexible learning spaces, though this varied with experience/professional development. Positive views were also less evident for questions related to low progress learners, suggesting that although New Zealand educators can see the benefits of flexible learning spaces, they seem more cautious about the value for those with learning problems.*

**Keywords:** Innovative Learning Environments; New Zealand primary school; reading, writing and mathematics; struggling learners / learning difficulties; questionnaire responses; experience/professional development.

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## INTRODUCTION

The Centre for Educational Research and Innovation studies of Innovative Learning Environments (OECD, 2013) contends that there are four key elements for effective schooling: teachers, students, content and resources. The last of these incorporates physical resources, such as the type of school buildings, infrastructure and facilities provided for learning and teaching to take place. This movement to large teaching and learning spaces (OECD, 2015) with multi-teacher, multi-class teaching has the potential to impact on this key aspect of schooling and, therefore, may raise concerns about its effects on learning for all students, and particularly for those experiencing difficulties with learning. In New Zealand, new school buildings in State primary schools are being built as 'Innovative Learning Environments' in order to create multiclass flexible learning spaces (see discussion document of the Ministry of Education '*Shaping Education- Future Direction; Te Tāreinga Mātauranga*' at <http://shapingeducation.govt.nz/recovery-programme/background-2>). These teaching spaces accommodate between two to six teachers, with cohorts from approximately 40 to 160 students, and can be created to be flexibly reconfigured with breakout teaching areas for small and large groups (Shank, 2005). However, the policy has also meant the restructuring of existing school buildings to develop makeshift flexible learning spaces, which can lead to acoustics, lighting and space restrictions inhibiting flexible learning practices. Experiences of using these different types of spaces may, therefore, lead to very different perspectives on the usefulness of such spaces for teaching.

Additionally, from a pedagogical perspective, teachers working alongside colleagues in flexible learning spaces are able to have conversations and decisions in real time and receive support through collegial feedback and critique. Nevertheless, this can also attach a considerable layer of complexity to teaching processes, as teachers must spend time together to plan, evaluate, discuss information from across the large cohort of students, review logistics, and discuss and seek agreement on teaching strategies (Johnson, 2003). A major challenge, therefore, is the willingness and abilities of teachers to adapt to collaborative de-privatised environments where negotiation and compromise may be critical for developing a harmonious learning environment. In contrast, collaborative teaching methods may provide a way of increasing the support of children with different learning needs, given that different teachers within a cohort will have different practical and professional development experiences. However, a survey of New Zealand teachers and principals about the implications of Innovative Learning Environments in their school context found that there was a lack of clarity about the fundamental rationales for co-teaching in such environment. Some respondents indicated that they already implement innovative teaching pedagogies without being situated in Innovative Learning Environments. Similarly, a number of participants raised concerns around the high noise level in Innovative Learning Environments that would not be conducive to learning (Smardon, Charteris, & Nelson, 2015). Again experiences and

professional development in co-teaching, as well as the use of flexible learning spaces, may be an important influence of views about the use of these types of school areas.

Problems with open-plan classrooms related to noise and distraction have been an on-going theme for such school spaces for many years. For example, research has suggested that the speech perception of young children was less efficient in open plan classrooms (Mealings, Demuth, Buchholz & Dillon, 2015; Shield, Greenland & Dockrell, 2010) unless appropriate measures are taken to reduce background noise – and better acoustics typically result from purpose-built environments or carefully restructured buildings. These difficulties may be perceived as a particular problem for literacy learning since an unclear utterance by a teacher may lead to poor learning of the connection between written letters and speech; and such connections have often been seen as a vital part of the development of reading strategies (see Gillon, 2004). Given that those with specific learning difficulties in reading (i.e., often referred to as dyslexia) have been found to show deficits in phonological awareness and processing (for example, see Gillon, 2004; Snowling, 2000), a noisy environment may be seen by educationalists as increasing difficulties for such children. Similarly, students who are struggling with learning may be more likely to show more off-task behaviours – to switch-off from the learning task (Everatt, Al-Sharhan, Al-Azmi, Al-Menaye & Elbeheri, 2011; Prochnow, Tunmer & Chapman, 2013). Increasing levels of potential distractions may also be perceived as particularly problematic for those tasked with the challenge to maintain attention of struggling learners. In New Zealand, children from low socioeconomic families have been found to be over-represented among those with lower levels of educational achievement (see Chamberlain, 2013), along with children from various cultural minority groups, such as those from Māori (the Indigenous people of New Zealand) or Pasifika (a term used to encompass students deriving from a range of Pacific Islands, such as Samoa, Tonga and Fiji) backgrounds, or those who may have immigrated to New Zealand with their families to escape problems in their home-country (see also McNaughton, Lai, MacDonald & Farry, 2004). Schools within areas of New Zealand comprising lower socioeconomic populations are distinguished by lower decile scores, and school staff from such lower decile areas, tasked with the responsibility to manage the learning of struggling learners, may have different views about the use of potentially more distractive school environments.

Therefore, children with learning difficulties may be perceived as a challenge for teachers in any context but particularly in more open-plan classrooms. However, the specific aspect of the challenge perceived by educators may depend on the underlying cause of the learning weakness: one caused by an underlying language weakness (e.g., dyslexia) may be considered differently from one due to lack of access to appropriate resources (i.e., due to a more deprived socio-economic background) – though the two are obviously going to interact. Therefore, perceptions of staff within the school context should provide a basis on which to determine the potential perceived impacts of changes to flexible learning spaces envisaged for the New Zealand education system.

More positive perspectives may lead to increased attempts to support, whereas negative attitudes may lead to a lack of perceived benefit for students with learning difficulties and hence little innovation, practice and improvement.

The focus of the current work is within primary schools, and learning difficulties associated with early school areas typically focus around problems with reading, writing and mathematics. Those related to reading difficulties are arguably the most widely studied, with dyslexia being the most likely to be quoted in the research literature. However, despite the research on dyslexia, educational policy related to learning difficulties such as dyslexia have only relatively recently been a focus in New Zealand (see Tunmer & Greaney, 2010). Dyslexia was formally recognised in government education literature in 2007: although a recent select committee report (Education and Science Committee, 2016) suggests a recognition of the growing importance within New Zealand of supporting children with learning difficulties. Indeed, concerns have been expressed in New Zealand about the persistent tail of students who under-achieve in reading (and writing) despite ongoing initiatives and programmes instigated by the New Zealand Ministry of Education to address the issue (see, for example, Chamberlain, 2013; Limbrick & Aikman, 2005; and see also Ministry of Education, 2010, 2011 and 2013). From 2001 to 2011, in the Progress in International Reading Literacy Study (PIRLS) of ten year-old students' achievement in reading, there has been no significant change in the mean scores of any of the four main ethnic groups (New Zealand European, Asian, Māori and Pasifika). Hence, school programmes that lead to additional problems for such learners may be perceived by staff as particularly problematic.

Similar difficulties have been associated with the learning of mathematics. Mathematics is integral to succeeding in everyday life. However, the Programme for International Student Achievement (PISA) results show that New Zealand achievement in mathematics has continued to decline from 2003 to 2012. As with the data on reading, children from low socioeconomic home backgrounds, and those belonging to minority cultures, are more highly represented as underachieving in mathematics, which is further exacerbated by having less equitable access to resources in schooling and in their homes (see, for example, Au 1998; Bishop 2003; Tuuta, Bradman, Hynds, Higgins, & Broughton, 2004). In a study of 23 high poverty schools in the US, Balfanz and Byrnes (2006) found links between under resourcing and achievement in mathematics. They suggested that sustained and effective teacher professional development combined with greater funding of resources were prerequisites in closing the achievement gap.

Consistent with the last point, one of the assumed benefits of a focus towards building and restructuring classrooms to be Innovative Learning Environments is the potential for increased flexibility in access to resources. Additionally, many of the support tools used for students with learning difficulties have been developed to be used via computer-based resources – and some students with learning difficulties seem to benefit (at least in terms of increased evidence of sustained motivation) from interactions with computer-

based tools (see, for example, discussions in: Beacham & Alty, 2006; Draffan, Evans & Blenkhorn, 2007; Elbeheri, Reid & Everatt, 2017; Smythe, 2010; Stetter & Hughes, 2010). Hence, perceptions of staff about such spaces may be more positive given such access to resources that can be used with students from more deprived contexts and with struggling learners. How this is perceived to support students with learning difficulties, though, is questionable since increased access to resources may positively impact only on those without an underlying learning difficulty. It may be argued that it is only if the increased access is used in a way to support those with specific needs that benefits to those with learning difficulties will be found.

The research reported in this paper, therefore, considers the views of educationalists within New Zealand schools who have varying levels of experience of using the innovative learning spaces that are the focus of the current work. Principals and teachers were asked to respond to a series of statements distributed via an internet-based survey system. Both were targeted by the research to give an indication of perceptions of the usefulness, or otherwise, of flexible learning spaces from those managing their use and development, and those tasked with using the spaces on a day-to-day basis.

## METHOD

A questionnaire was developed for the purpose of sampling the views of New Zealand primary school staff on flexible learning spaces, particularly in regard to their use with students who may be struggling with the acquisition of literacy and mathematics. The survey comprised questions on the background of the respondent (discussed in the following paragraphs to describe the cohort) and a series of statements about flexible learning spaces as they relate to teaching practice (e.g., *'Co-teaching in FLS allows teachers to plan and work together to better identify explicit needs in reading'*) and issues of professional development (e.g., *'In a traditional one-teacher per classroom setting, where a teacher works alone, there is a lack of opportunity for teachers to participate in genuine, ongoing professional learning about teaching reading and student learning in the context'*), as well as statements more focused on learners (e.g., *'Flexible learning classrooms are noisy, making it difficult for students to concentrate'*). (Table 1 shows the statements used, together with frequencies of responses; Table 2 shows how they were divided across the different issues targeted). Background questions included those asking about experience of using flexible learning spaces, and the type of classrooms in the school in which they are working, which were used as part of the analyses of the data (e.g., *'How would you rank the amount of professional development you have had on co-teaching in flexible learning spaces (Innovative Learning Environments)'*). Opportunities were also given for the respondents to provide comments to clarify their perceptions. The questions and statements aimed to cover those issues related to flexible learning spaces discussed in the introduction.

The questionnaire was loaded into the Qualtrics survey system and distributed to links on national web-sites and society/group email addresses across New Zealand. Emails, which included a link to the Qualtrics questionnaire, were sent to the links/emails that explained the survey and requesting participation in the survey. Principals were targeted through the distribution of the survey to organisation such as the New Zealand Principal's Federation and to regional primary principals associations, in order to access the views of those managing the development of flexible learning spaces within primary schools. Teacher's views were targeted by distribution through email lists of registered teachers. The Qualtrics site was open for about one month and 283 respondents from primary schools completed and submitted the questionnaire.

The responses were analysed via quantitative (multiple-choice statements) and qualitative (open-end comments) procedures. Quantitative analyses involved calculating the frequency of responses to items, mainly for description of the sample. A small number of  $\chi^2$  analyses were also conducted to describe the background of the sample in terms of relationships between exposure to flexible learning classrooms, professional development in co-teaching and the type of school classrooms spaces. Analyses of responses then continued by reducing statements eliciting views about flexible learning spaces to a set of factors. This involved principal component analysis leading to the selection of the number of factors for rotation: choosing factors with Eigenvalues greater than 1 meant that selection was mainly data driven, though a scree plot was produced to support selection. Factors were then rotated using a Varimax procedure, which assumes independent factors. (Alternative procedures, not assuming independent factors, were also used but produced similar results.) Kaiser normalisation procedures were used in the rotation: these involved scores being statistically normalised (i.e., transformed to approximate a normal distribution) for factor rotation and then denormalised back to the original data scale for interpretation. Interpretation of the meaning of these factors was based on an understanding of the development of the questionnaire statements on which each factor loaded. Factors scores were then used to assess potential differences between groups of respondents, primarily using analyses of variance. The reduction to a small number of factors based on correlated statements avoided the potential problem that a large numbers of analyses of individual statements would produce in terms of increased family-wise error (i.e., the increase in chance significant effects when performing several analyses with the same significance level).

Following the quantitative analyses, qualitative analysis of open-question responses were conducted. Initial analysis of the qualitative data identified emerging themes that were refined into coding categories (Fraenkel & Wallen, 2006; Watling & James, 2007). Links between these coding categories were identified based on interpretation of the researcher (see Strauss & Corbin, 1990). This entailed looking for concepts and themes in the data that linked with one another and/or formed clusters to give a denser net of support for emerging main ideas. Finally, selective coding was used to scan the data and prior codes to form the total analysis around a smaller set of core ideas (Charmaz,

2003; Strauss & Corbin, 1990). Throughout this process of selective coding the key codes that reappeared repeatedly directed the interpretation of the findings reported in this paper (Charmaz, 2003).

The 283 respondents comprised 125 principals and 95 teachers, with a further 60 in middle management roles (teachers with head of department responsibilities or deputy principals). In New Zealand, principals would typically have a solely managerial and leadership role, with no classroom teaching. School staff in middle management roles would be likely to have a mix of classroom teaching and release time for their management role. Teachers typically would be solely involved in teaching in classrooms. As each of these three categories of respondents have differing roles in a school, this research sought to ascertain their potentially differing perceptions. The majority (200 or 70%) were female and from New Zealand European background (235 or 83%; plus 24 from New Zealand Māori and 24 from non-NZ backgrounds). The majority had worked at their current school for more than five years (170 respondents; with the remaining 40% being equally distributed across the categories of having worked at the school for either 1 to 2 years or 3 to 4 years). The majority worked in full primary (46%) or contributing primary (47%) schools, with only 19 staff working in an intermediate school context. Most schools (93%) were state schools, with only 19 being integrated. Schools within which the staff worked were mainly in cities (148 respondents) or towns (70 respondents), with only about 22-23% being situated in more rural locations. Schools covered the full range of deciles used in New Zealand to classify the socioeconomic distribution of the communities within the catchment areas of state schools. However, there were more respondents from higher decile schools: 20% of respondents were from decile 10 schools, about 10 to 15% each from decile 7 to 9 schools, about 7 to 9% from decile 2 to 6 schools, and only 5% from decile 1 schools. About 40% of respondents considered that their school was multicultural in terms of the ethnicity of the students, and a roughly equal number considered that their school comprised 70 to 90% of students from New Zealand European backgrounds – less than 20% considered their school to comprise more than 90% New Zealand European background children.

An important question for the present work was the levels of flexible learning space experience of the respondents. Therefore, questions also asked for details about the type of classrooms in their school and their training in the use of these spaces and the practices needed to co-teach in such environments. Among the respondents, 91 (32%) indicated that they worked in schools with predominantly traditional classrooms (one teacher, one class cohort, configurations). A further 79 (28%) of respondents indicated that they worked in schools where traditional classrooms had been adapted to be flexible learning spaces. Another 90 respondents (again, about 32%) indicated that they were in schools where purpose-built flexible learning spaces had been recently built – and an additional 21 (7%) of respondents indicated that they worked in a recently built school comprising all flexible learning classrooms. These latter two groups were combined to consider the views of those experiencing purpose-built environments

compared to those with adapted classrooms and little experience of working in flexible learning spaces.

In terms of exposure to flexible learning spaces, most respondents indicated some level of exposure (150 or 53%), with 61 (22%) indicating minimal exposure and 72 (25%) indicating extensive exposure (this question provided these three closed responses for participants). These frequencies were consistent with the responses to the three classroom types discussed in the previous paragraph: those from schools with purpose-built or adapted flexible learning spaces showed a greater likelihood to indicate extensive exposure, whereas those from schools with predominantly traditional classrooms showed a greater likelihood to have minimal exposure ( $\chi^2 = 17.25$ ,  $df = 4$ ,  $p = .002$ ). In contrast, professional development in co-teaching in flexible learning spaces was more likely to be either minimal (39%) or some (44%), with only 48 respondents (17%) indicating extensive professional development (again, this questions provided these three closed responses for participants). However, levels of co-teaching in flexible learning spaces professional development were related to exposure to flexible learning spaces ( $\chi^2 = 129$ ,  $df = 4$ ,  $p < .001$ ), with increasing levels of exposure being more likely to be related to more co-teaching professional development. Levels of professional development were also related to the three classroom types, with those from schools with predominantly traditional classrooms showing a greater likelihood to have minimal professional development ( $\chi^2 = 17.66$ ,  $df = 4$ ,  $p = .001$ ).

The type of classroom used in the school of the respondent may also partially explain the bias towards more staff from high decile schools. For those in the lowest three decile levels (1 to 3), the modal (most frequent) response was for staff to be in schools with predominantly traditional classrooms, whereas for those in the highest three decile levels (8 to 10), the modal response was for staff to be in schools with purpose-built flexible learning spaces. For those in the four middle decile levels (4 to 7), the distribution of responses across classroom types was almost equivalent. This may have led to more staff from higher decile schools to respond given their background experience.

After one month of the questionnaire site being open, the data from the Qualtrics system were imported into a statistical package (SPSS version 24) and analysed. The procedures initially looked at frequency of responses to background questions (discussed above) and statements (Table 1). Factor analyses procedures were then implemented on the statements to reduce the number of analyses on statements (Table 2). Combined statements scores were then analysed to contrast background experience of the respondents with their responses to the statements. Given a significant effect for the combined statements scores, individual statements were then considered to determine relationships between specific views and background experience. This procedure allowed for a detailed consideration of the responses, but reduced the chance significant effects by reducing the number of analyses performed.



## RESULTS

### Quantitative data

Table 1 presents the frequency of responses to each of the statements in the current questionnaire. Where there is a clear modal response (at least 10 responses greater than the next response), this is individually highlighted: less clear modal responses are lighter shaded. Overall, these responses tend to be more positive towards flexible learning spaces and their potential usefulness for primary school education.

Responses were then analysed using Factor Analysis procedures. The results of these Factor Analysis procedures can be found in Table 2, which provides factor loadings for each statement based on a three-factor solution. This factor solution was determined initially using principal component analysis and Eigenvalues greater than 1; though determination of factors was also based on observation of a scree plot and a theoretical understanding of the statements development. A four-factor solution was also suggested, but the fourth factor comprised only one statement (*‘Collaboration amongst teachers is essential for effective use of a flexible learning space’*); most likely due to the fact that almost all respondents (237) strongly agreed with this statement. Given that other statements covered the similar concept of collaboration, and were more focused on literacy or mathematics, and this statement produced very little variance to analyse, it was removed from the analyses, which then produce the current three-factor solution. These three factors explained over 70% of the variance. The factor loadings in Table 2 were determined using a Varimax (with the default of Kaiser Normalization) rotation which converge in five rotations.

Table 2 shows the loadings for the statements on three factors. Statements that mainly load on Factor 1 focus on teaching and co-teaching in reading, writing and mathematics; henceforth referred to as a teaching factor. Statements that mainly load on Factor 2 focus on issues to do with the student/learner, or statements that lead to the teacher thinking about the student/learner; therefore, this factor will be referred to as a learner factor. Factor 3 comprises three statements that elicit views about professional learning in reading, writing and mathematics – and, therefore, will be referred to as a professional development factor. Five statements, which refer to low progress learners or issues related to student learning, and hence are related to the learner factor, also loaded on the teaching factor, which suggests that the respondents considered these statements as related to both teaching and learner issues. Therefore, these five statements will not be analysed in combination with the other three factors, but will be considered separately. However, theoretically, these statements were developed more as a feature of the learner, and the low progress statements were included for the specific purpose of eliciting views about flexible learning spaces and those who would be perceived as having difficulties with learning. Hence, they will be included in further analyses. Factors were then given a score by simply transforming response options to

Table 1. Frequency of responses of the respondents to each of the questionnaire statements

QUESTIONNAIRE STATEMENTS	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Students in FLS have more opportunity to relate to others and develop effective interaction skills with a diverse range of people.	71	114	57	19	9
Students in flexible learning spaces have more opportunity to develop skills as self-regulated learners.	69	106	51	35	9
Flexible learning classrooms are noisy, making it difficult for students to concentrate.	27	60	94	79	10
Teaching in flexible learning spaces makes management of students difficult.	14	51	62	111	32
Teachers find it more time consuming working in FLS because more time is needed to plan ... and discuss teaching strategies.	42	73	65	68	22
Teaching in flexible learning spaces makes acceleration of low progress learners difficult.	15	32	53	138	32
The large cohorts of students taught in FLS can adversely affect teacher's judgements about individual children's learning.	18	46	73	105	28
Collaboration amongst teachers is essential for effective use of a flexible learning space.	237	26	3	0	3
Co-teaching in flexible learning spaces allows teachers to plan and work together to better identify explicit needs in reading.	81	106	50	15	4
Teaching instructional reading effectively can be further enhanced in FLS when teachers have the opportunity to discuss ...	65	111	54	23	3
Co-teaching in flexible learning spaces allows teachers to plan and work together to better identify explicit needs in writing.	71	122	46	14	3
In a traditional one-teacher per classroom setting, there is a lack of opportunity for professional learning about teaching reading.	26	67	50	87	26
Low progress learners in reading will benefit from being in a co-teaching flexible learning space.	29	71	108	37	11
Teaching writing effectively can be further enhanced in FLS when teachers have the opportunity to discuss ...	53	118	61	21	3
In a traditional one-teacher per classroom setting, there is a lack of opportunity for professional learning about teaching writing.	18	67	50	93	28
Low progress learners in writing will benefit from being in a co-teaching flexible learning space.	33	84	99	32	8
Co-teaching in flexible learning spaces allows teachers to plan and work together to better identify explicit needs... mathematics.	62	122	55	10	6
Teaching mathematics effectively can be further enhanced in FLS when teachers have the opportunity to discuss ...	49	124	59	16	8
In a traditional one-teacher per classroom setting, there is a lack of opportunity for professional learning ... teaching mathematics.	18	66	58	94	20
Low progress learners in mathematics will benefit from being in a co-teaching flexible learning space.	28	89	96	35	8

Table 2. Factor loadings for each statement based on a three-factor solution

QUESTIONNAIRE STATEMENTS	FACTOR 1	FACTOR 2	FACTOR 3
Co-teaching in FLS allows teachers to plan and work together to better identify explicit needs in reading.	<b>.838</b>	.235	.141
Teaching instructional reading effectively can be further enhanced in FLS when teachers have the opportunity to discuss, observe and work alongside another teacher on a minute-by-minute, daily-basis in a FLS.	<b>.747</b>	.421	.188
Co-teaching in FLS allows teachers to plan and work together to better identify explicit needs in writing.	<b>.881</b>	.242	.125
Teaching writing effectively can be further enhanced in FLS when teachers have the opportunity to discuss, observe and work alongside another teacher on a minute-by-minute, daily-basis in a FLS.	<b>.650</b>	.432	.338
Co-teaching in FLS allows teachers to plan and work together to better identify explicit needs in mathematics.	<b>.860</b>	.291	.194
Teaching mathematics effectively can be further enhanced in FLS when teachers have the opportunity to discuss, observe and work alongside another teacher on a minute-by-minute, daily-basis in a FLS.	<b>.727</b>	.366	.345
Flexible learning classrooms are noisy, making it difficult for students to concentrate.	-.239	<b>-.747</b>	-.125
Teaching in FLS makes management of students difficult.	-.237	<b>-.829</b>	-.147
Teachers find it more time consuming working in FLS because more time is needed to plan, evaluate, share information, review logistics and discuss teaching strategies.	-.155	<b>-.534</b>	.002
Teaching in FLS makes acceleration of low progress learners difficult.	-.278	<b>-.777</b>	-.095
The large cohorts of students taught in FLS can adversely affect teacher's judgements about individual children's learning in curriculum areas.	-.292	<b>-.733</b>	-.146
Students in FLS have more opportunity to relate to others and develop effective interaction skills with a diverse range of people in a variety of contexts.	<b>.447</b>	<b>.496</b>	.317
Students in FLS have more opportunity to develop skills as self-regulated learners.	<b>.456</b>	<b>.480</b>	.288
Low progress learners in reading will benefit from being in a co-teaching FLS.	<b>.520</b>	<b>.544</b>	.350
Low progress learners in writing will benefit from being in a co-teaching FLS.	<b>.506</b>	<b>.550</b>	.334
Low progress learners in mathematics will benefit from being in a co-teaching FLS.	<b>.534</b>	<b>.569</b>	.342
In a traditional one-teacher per classroom setting, where a teacher works alone, there is a lack of opportunity for teachers to participate in genuine, ongoing professional learning about teaching reading and student learning in the context.	.183	.200	<b>.895</b>
In a traditional one-teacher per classroom setting, where a teacher works alone, there is a lack of opportunity for teachers to participate in genuine, ongoing professional learning about teaching writing and student learning in the context.	.227	.117	<b>.929</b>
In a traditional one-teacher per classroom setting, where a teacher works alone, there is a lack of opportunity for teachers to participate in genuine, ongoing professional learning about teaching mathematics and enhancing student learning in the context.	.238	.098	<b>.926</b>

values from 1 to 5, ensuring that these values within each set of responses indicated the same positive or negative valence, and totalling these response scores within each factor. These four total scores were then used in the following analyses which contrasted different groups of respondents, first using analysis of variance techniques and then chi-square analyses.

The first grouping variable was the type of classroom indicated by the respondents as occurring within their school, which was divided into three categories: schools with built flexible learning spaces, schools with adapted flexible learning spaces and schools with predominantly traditional classrooms. Analyses of variance contrasting the total response scores can be found in Table 3. These indicated significant differences between the respondents within the three classroom type categories for the teaching and learning factors (including the statements that loaded on both), but not for the professional development factor. Pairwise posthoc comparisons suggested that the traditional classroom group responded differently from the other two groups on the teaching and teaching+learner scores, but that only the adapted classroom group differed significantly from the traditional group on the learner scores: those in traditional classrooms were less positive in responses about flexible learning spaces.

Table 3. Comparisons of total response scores across the three types of classrooms indicated by respondents as occurring within their schools

		N	Mean	SD	Anova	
Teaching	Built FLS	97	2.06	.79	$F_{(2,250)}=10.55$ $p<.001$	built=adapted<trad
	Adapted FLS	74	1.90	.80		
	Trad-classes	82	2.45	.75		
Learner	Built FLS	106	3.18	.89	$F_{(2,265)}=4.97$ $p=.008$	adapted>trad
	Adapted FLS	75	3.42	.82		
	Trad-classes	87	3.01	.73		
Teaching+Learner	Built FLS	98	2.40	.87	$F_{(2,251)}=9.49$ $p<.001$	built=adapted<trad
	Adapted FLS	74	2.25	.81		
	Trad-classes	82	2.80	.78		
Professional Development	Built FLS	98	3.07	1.11	$F_{(2,251)}=1.31$ $p=.271$	NS
	Adapted FLS	74	3.03	1.12		
	Trad-classes	82	3.29	1.06		

*Note: Teaching = Factor 1; Learner = Factor 2; Profess Develop = Factor 3; Teaching+Learner = statements that loaded on both teaching and learner factors; Built FLS = schools with built flexible learning spaces; Adapted FLS = schools with adapted flexible learning spaces; Trad-classes = schools with traditional classrooms*

The second grouping factors was the position held by the participant, in order to contrast views of principals and teachers; though a third category of middle managers was also included to ensure that the teaching and management responsibilities of this group of staff were taken into account. Analyses of variance contrasting the scores on the total response scores can be found in Table 4. These analyses produce significant differences between the groups for the teaching and the learner factors, but not for the professional development or teaching+learner totals. Posthoc pairwise comparisons argued for differences between principals and teachers, with the middle managers showing total scores more similar to those of the principals: teachers were less positive in their responses. Interactions with type of classroom were also considered given that experience of flexible learning spaces was predicted to influence views. These are also reported in Table 4 (bracketed 'Int' results), but were non-significant for all four total scores.

Table 4. Comparisons of total response scores across the positions currently held by respondents

		N	Mean	SD	Anova	
Teaching	Principal	112	2.04	.78	$F_{(2,249)}=3.86$ $p=.022$ (Int: $F_{(4,241)}=0.32$ $p=.862$ )	principal < teacher
	Middle management	58	2.04	.77		
	Teacher	82	2.34	.88		
Learner	Principal	122	3.35	.72	$F_{(2,264)}=7.40$ $p=.001$ (Int: $F_{(4,256)}=0.29$ $p=.888$ )	principal= middle > teacher
	Middle management	58	3.27	.93		
	Teacher	87	2.91	.88		
Teaching+ Learner	Principal	112	2.42	.81	$F_{(2,250)}=1.33$ $p=.267$ (Int: $F_{(4,242)}=0.35$ $p=.843$ )	NS
	Middle management	58	2.42	.90		
	Teacher	83	2.61	.89		
Professional Development	Principal	112	3.04	1.06	$F_{(2,250)}=0.72$ $p=.488$ (Int: $F_{(4,242)}=0.57$ $p=.688$ )	NS
	Middle management	58	3.11	1.25		
	Teacher	83	3.23	1.05		

Note: Teaching = Factor 1; Learner = Factor 2; Profess Develop = Factor 3; Teaching+Learner = statements that loaded on both teaching and learner factors

Table 5. Comparisons of total response scores across school deciles

		N	Mean	SD	Anova	
Teaching	decile 1 to 3	48	2.20	.90	F <sub>(2,252)</sub> =.31 p=.734 (Int: F <sub>(4,244)</sub> =0.05 p=.995)	NS
	decile 4 to 7	90	2.17	.72		
	decile 8 to 10	117	2.10	.86		
Learner	decile 1 to 3	52	3.18	.92	F <sub>(2,266)</sub> =1.06 p=.349 (Int: F <sub>(4,258)</sub> =0.74 p=.566)	NS
	decile 4 to 7	95	3.09	.82		
	decile 8 to 10	122	3.26	.83		
Teaching+ Learner	decile 1 to 3	48	2.55	.94	F <sub>(2,252)</sub> =1.31 p=.271 (Int: F <sub>(4,244)</sub> =0.17 p=.955)	NS
	decile 4 to 7	90	2.58	.75		
	decile 8 to 10	117	2.39	.90		
Professional Development	decile 1 to 3	48	3.18	1.18	F <sub>(2,252)</sub> =1.00 p=.368 (Int: F <sub>(4,244)</sub> =1.48 p=.209)	NS
	decile 4 to 7	90	3.23	1.04		
	decile 8 to 10	117	3.02	1.11		

*Note: Teaching = Factor 1; Learner = Factor 2; Profess Develop = Factor 3; Teaching+Learner = statements that loaded on both teaching and learner factors*

The third and fourth grouping variables considered were the demographic backgrounds of the schools, since students from lower socioeconomic and minority background may be predicted to show evidence of greater learning problems than those from higher socioeconomic and dominant New Zealand European ethnic backgrounds. These analyses can be found in Table 5 and 6. For these analyses, deciles were combined into 1 to 3, 4 to 7 and 8 to 10; whereas student ethnic backgrounds were categorised in 90%+ New Zealand European, 70 to 90% New Zealand European, and multicultural. For all four total scores, non-significant analyses of variance were produced; and interactions with classroom type were also non-significant.

The final two grouping variables considered the level of exposure to flexible learning spaces and the level of professional development in co-teaching. For exposure to flexible learning spaces, all four total score analyses produced significant effects such that those with extensive exposure were more positive about Innovative Learning Environments than those with some or minimal exposure (see Table 7): this effect showed

Table 6. Comparisons of total response scores across student ethnic background profiles

		N	Mean	SD	Anova	
Teaching	90%+ NZEuropean	47	2.20	.88	F <sub>(2,251)</sub> =.17 p=.840 (Int: F <sub>(4,245)</sub> =2.09 p=.082)	NS
	70-89% NZEuropean	108	2.12	.76		
	Multicultural	99	2.15	.87		
Learner	90%+ NZEuropean	49	3.15	.84	F <sub>(2,266)</sub> =.06 p=.943 (Int: F <sub>(4,258)</sub> =0.43 p=.786)	NS
	70-89% NZEuropean	114	3.19	.78		
	Multicultural	106	3.20	.91		
Teaching+ Learner	90%+ NZEuropean	48	2.53	.88	F <sub>(2,252)</sub> =.35 p=.704 (Int: F <sub>(4,244)</sub> =0.88 p=.478)	NS
	70-89% NZEuropean	108	2.44	.81		
	Multicultural	99	2.53	.90		
Professional Development	90%+ NZEuropean	48	3.18	1.04	F <sub>(2,252)</sub> =1.43 p=.241 (Int: F <sub>(4,244)</sub> =1.17 p=.324)	NS
	70-89% NZEuropean	108	2.99	1.12		
	Multicultural	99	3.25	1.10		

*Note: Teaching = Factor 1; Learner = Factor 2; Profess Develop = Factor 3; Teaching+Learner = statements that loaded on both teaching and learner factors*

no evidence of interacting with classroom type (see 'Int' analyses in Table 7). For the co-teaching professional development grouping, significant effects were found for all total scores except for the professional development factor (see Table 8); but there was no interaction with classroom type ('Int' analyses in Table 8). Overall, the greater the level of co-teaching professional development, the more positive the responses were about Innovative Learning Environments.

In order to investigate potential relationships between experience of flexible learning spaces and staff's views of their effects on learners, the statements that formed the learner factor and those that loaded on both teaching and learner factors were further analysed by contrasting frequency of responses on these statements against the categorisation of classroom type. The latter variable was chosen given its significant effects on learner total scores above and because it was related to the exposure to flexible learning spaces and professional development in co-teaching variables, which also showed effects on learner scores. The results of these analyses can be found in

Table 7. Comparisons of total response scores across category of exposure to flexible learning spaces

		N	Mean	SD	Anova	
Teaching	minimal	51	2.47	.86	F <sub>(2,252)</sub> =8.82 p<.001 (Int: F <sub>(4,244)</sub> =0.29 p=.885)	minimal=some> extensive
	some	138	2.17	.79		
	extensive	66	1.85	.77		
Learner	minimal	54	2.76	.91	F <sub>(2,267)</sub> =11.56 p<.001 (Int: F <sub>(4,259)</sub> =0.66 p=.621)	minimal<some< extensive
	some	148	3.14	.76		
	extensive	68	3.63	.75		
Teaching+Learner	minimal	51	2.86	.85	F <sub>(2,253)</sub> =16.58 p<.001 (Int: F <sub>(4,245)</sub> =0.63 p=.643)	minimal=some> extensive
	some	139	2.57	.80		
	extensive	66	2.03	.79		
Professional Development	minimal	51	3.32	1.11	F <sub>(2,253)</sub> =3.83 p=.023 (Int: F <sub>(4,245)</sub> =0.46 p=.765)	minimal=some> extensive
	some	139	3.20	1.04		
	extensive	66	2.82	1.15		

*Note: Teaching = Factor 1; Learner = Factor 2; Profess Develop = Factor 3; Teaching+Learner = statements that loaded on both teaching and learner factors*

Tables 9 and 10. In Table 9, the frequency of responses for each statement that references low progress learners is contrasted against the different classroom types. In Table 10, the frequency of responses for statements not specifically referring to low progress learners is contrasted against the classroom variable. In all analyses, standardised residuals were calculated to determine higher or lower than expected response frequencies, and chi-square analyses for the relationship between classroom type and statements response frequencies were performed. For all analyses, there was evidence for a relationship between classroom type and response frequencies, except for the statement about teachers' judgements about individual children's learning (i.e., *'The large cohorts of students taught in FLS can adversely affect teacher's judgements about individual children's learning in curriculum areas'*). With this exception, the significant relationships suggested that those in schools with adapted flexible learning spaces were generally more positive about Innovative Learning Environments than those



Table 8. Comparisons of total response scores across category of professional development in co-teaching

		N	Mean	SD	Anova	
Teaching	minimal	91	2.36	.82	$F_{(2,252)}=8.05$ $p<.001$ (Int: $F_{(4,244)}=0.72$ $p=.579$ )	minimal >extensive
	some	117	2.12	.79		
	extensive	47	1.79	.78		
Learner	minimal	100	2.90	.85	$F_{(2,267)}=12.98$ $p<.001$ (Int: $F_{(4,259)}=0.13$ $p=.972$ )	minimal<some< extensive
	some	123	3.27	.76		
	extensive	47	3.60	.83		
Teaching+ Learner	minimal	91	2.75	.80	$F_{(2,253)}=10.51$ $p<.001$ (Int: $F_{(4,245)}=0.93$ $p=.449$ )	minimal>some> extensive
	some	118	2.45	.85		
	extensive	47	2.08	.81		
Professional Development	minimal	91	3.26	1.08	$F_{(2,255)}=2.30$ $p=.103$ (Int: $F_{(4,245)}=2.01$ $p=.093$ )	NS
	some	118	3.14	1.04		
	extensive	47	2.84	1.24		

*Note: Teaching = Factor 1; Learner = Factor 2; Profess Develop = Factor 3; Teaching+Learner = statements that loaded on both teaching and learner factors*

in schools with predominantly traditional classrooms. The interesting contrast, however, was with those in schools with purpose built flexible learning spaces who were more mixed in their responses than the adapted group. Despite this group indicating overall more exposure to flexible learning spaces and more professional development in co-teaching for such spaces, they were not uniformly positive in their responses. In contrast to those in the adapted flexible learning spaces group, and more consistent with the traditional classrooms group, neutral was the modal response for the statement about flexible learning spaces being noisy and difficult for concentration. Similarly, there was a tendency for them to be more likely than expected (see residual scores greater than 1) to agree or to strongly agree that such flexible learning spaces increased difficulties in the management of students and the time needed by teachers to plan, evaluate, share information, review logistics and discuss teaching strategies. And they were slightly less positive than those in the adapted classrooms group about students being able to relate

Table 9. Statements related to low progress learners

		STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	
Difficult acceleration for low progress learners	Built FLS	9 (1.5)	11 (-.5)	17 (-.9)	53 (-.2)	16 (.9)	$\chi^2=30.48,$ $p<.001$
	Adapted FLS	1 (-1.5)	7 (-.7)	7 (-2.0)	47 (1.4)	13 (1.4)	
	Trad- classes	4 (-.3)	14 (1.1)	29 (2.8)	37 (-1.1)	3 (-2.3)	
Benefit for low progress learners in reading	Built FLS	13 (.5)	29 (.4)	40 (-.3)	11 (-.8)	5 (.4)	$\chi^2=16.41$ $p=.037$
	Adapted FLS	14 (1.9)	22 (.4)	26 (-1.0)	11 (.2)	1 (-1.2)	
	Trad- classes	2 (-2.4)	19 (-.8)	42 (1.2)	14 (.7)	5 (.8)	
Benefit for low progress learners in writing	Built FLS	15 (.6)	37 (.9)	31 (-1.2)	11 (-.4)	4 (.8)	$\chi^2=17.80,$ $p=.023$
	Adapted FLS	15 (1.7)	24 (0)	27 (.3)	7 (-.8)	1 (-.7)	
	Trad- classes	3 (-2.3)	22 (-.9)	41 (1.6)	14 (1.1)	2 (-.2)	
Benefit for low progress learners in maths	Built FLS	11 (.1)	44 (1.7)	28 (-1.5)	11 (-.6)	4 (.5)	$\chi^2=20.75,$ $p=.008$
	Adapted FLS	14 (2.0)	22 (-.7)	29 (.2)	8 (-.6)	1 (-.9)	
	Trad- classes	3 (-2.0)	22 (-1.2)	39 (1.4)	15 (1.2)	3 (.3)	

to others and develop better interaction skills. Similarly, for the statements about low progress learners, those in schools with purpose built flexible learning spaces were more mixed in their views about whether such environments would make acceleration difficult for students with learning weaknesses. Finally, the purpose build flexible learning spaces group showed evidence of seeing benefits for low progress learners when it came to mathematics, but they were more neutral about the benefits for reading – indeed, the modal response for all groups was neutral about the benefits for poor readers.

Table 10. Other statements related to learners

		STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	
Noisy, difficult for students to concentrate	Built FLS	11 (.2)	23 (-.2)	37 (0)	28 (-.5)	7 (1.5)	$\chi^2=16.58$  p=.035
	Adapted FLS	6 (-.5)	17 (.1)	18 (-1.6)	32 (2.2)	2 (-.5)	
	Trad-classes	9 (.2)	20 (.1)	39 (1.5)	18 (-1.5)	1 (-1.2)	
Management of students difficult	Built FLS	6 (.4)	25 (1.1)	16 (-1.7)	46 (.4)	13 (.1)	$\chi^2=24.01$  p=.002
	Adapted FLS	2 (-.9)	10 (-1.1)	15 (-.6)	32 (.2)	16 (2.4)	
	Trad-classes	5 (.4)	16 (-.1)	31 (2.4)	32 (-.6)	3 (-2.3)	
Teachers find it more time consuming	Built FLS	21 (1.2)	28 (-.1)	19 (-1.3)	30 (.6)	8 (-.2)	$\chi^2=21.45$  p=.006
	Adapted FLS	11 (-.1)	19 (-.3)	14 (-1.0)	19 (0)	12 (2.4)	
	Trad-classes	9 (-1.2)	25 (.3)	32 (2.4)	19 (-.7)	2 (-1.9)	
Adverse to judgements about individual children's learning	Built FLS	7 (.1)	18 (0)	30 (.2)	36 (-.8)	15 (1.2)	$\chi^2=9.78$  p=.281
	Adapted FLS	4 (-.3)	11 (-.5)	15 (-1.2)	36 (1.3)	9 (.4)	
	Trad-classes	6 (.2)	17 (.5)	28 (.9)	32 (-.3)	4 (-1.7)	
Students can relate to others and develop interaction skills	Built FLS	28 (0)	49 (.6)	21 (-.3)	5 (-.8)	3 (-.3)	$\chi^2=27.27$  p=.001
	Adapted FLS	32 (2.7)	29 (-.5)	8 (-2.0)	5 (0)	1 (-1.0)	
	Trad-classes	11 (-2.5)	35 (-.3)	28 (2.2)	8 (.9)	5 (1.2)	
Students can develop as self-regulated learners	Built FLS	33 (1.1)	37 (-.7)	23 (.6)	10 (1.0)	3 (-.1)	$\chi^2=19.70$  p=.012
	Adapted FLS	24 (1.1)	35 (1.0)	7 (-1.9)	8 (-.6)	1 (-.8)	
	Trad-classes	12 (-2.2)	33 (-.2)	21 (1.1)	17 (1.7)	4 (.9)	

## QUALITATIVE RESPONSES

In the open sections allocated for respondents' comments, concerns for special needs learners in these large flexible learning spaces were further expressed/clarified. For example, a female deputy principal from a school where some recently built flexible learning spaces were added to a traditional single teacher classroom school, stated:

*Special needs children find flexible learning spaces particularly challenging.*

Another, middle management leader from a school where some of the classrooms had been adapted to flexible learning spaces, indicated that the quality of the teachers was key, but had concerns about special needs students not always being supported appropriately in their learning in flexible learning spaces.

*It all depends on the quality of the teachers not the spaces. We have Instructional Rounds where teams observe a teacher teaching and give feedback and feed forward. Some inclusive education students can get lost in these big spaces.*

Although the idea of low progress learners 'getting lost' in this type of learning environment is potentially worrying, the qualitative comments emphasised that the teacher and pedagogical approaches implemented were critical, irrespective of the type of learning spaces. For example, a male principal from a school where there were many traditional classrooms converted to flexible learning spaces suggested that the quality of the teaching for low progress learners was dependent on the teacher rather than the physical spaces and the number of teachers within these spaces.

*Flexible spaces allow for much more teacher interaction and benefit to learners, but the progress of low achieving children will still depend on the 1:1 or personalised tutoring and the richness of the activities - which can happen in either style class. However, the ability to interact with others in the flexible space is built in to the programme, but - again - can also happen in single cell rooms.*

In a flexible learning space there is an opportunity for the students to have more than one teacher. One middle management respondent expressed her concern about the mobility of the early years' readers amongst the teachers in the flexible learning space in the newly built flexible learning spaces school where she was working.

*I have real concerns that junior reading needs are NOT being addressed when teachers swap groups every week or two so the child has no continuity of teaching. Whether or not they discuss the child's needs, no two teachers teach the same and so the child doesn't have the same instruction.*

## DISCUSSION

Overall, the results were generally positive about flexible learning spaces in New Zealand schools. This positive perspective was fairly consistent across decile and ethnic groupings of the schools within which the respondents were working. Although, principals were slightly more positive than teachers, these differences were less evident when low progress learners in reading, writing and mathematics were the focus. It is interesting to note that despite teachers and pedagogy being seen as critical in the open-responses, there was a dearth of comments addressing explicit knowledge of meeting the learning needs of low progress learners within these changes to types of school buildings. Considering the tail of students in New Zealand schools who are underachieving in reading, writing and mathematics (see, for example, Chamberlain, 2013), it would be reassuring to know that school leaders were viewing these students' learning outcomes as a priority and that they were articulating some specific data to show that effective teachers are providing supportive learning for low progress learners within these innovations in school buildings. Unfortunately, schooling can have a tendency to validate the status quo of who achieves and changes in school environments may lead to the same outcome. For example, Peterson's (1979) research on open plan classrooms of the 1960s to 1980s found that it was the high achieving, task orientated students who were more successful in their learning when in an open plan, student directed learning environment. This was particularly the situation in the teaching of reading, writing and mathematics, which often involved a direct instruction approach (Peterson, 1979). What remains uncertain is how the most at risk students (such as low progress learners or those with learning difficulties) fare in larger teaching areas with between 40 to 140 students and two to six teachers within in flexible learning space schooling. The present data from staff in New Zealand suggest that they may be uncertain about the benefits and challenges. Even those with evidence of more experience of flexible learning spaces (in terms of working in purpose built spaces, and having more exposure and training) showed trends to be more cautious about the influence of flexible learning spaces on students with learning difficulties.

Such findings may be consistent with some of the points covered in the introduction to this paper (see discussions related to: Everatt et al., 2011; Mealings et al., 2015; Prochnow et al., 2013; Shield et al., 2010). Potential increases in distraction, which have been associated with open plan classrooms with large numbers of students, may be seen as impacting specifically on students with difficulties in learning. In addition, large numbers of students may be seen as making it more difficult for staff to monitor students who may be seen as finding self-engagement in learning more challenging (typically, those who are seen as struggling). Without careful planning in the use of flexible learning spaces, these influences may negate any benefits there may be from the increase in technical resources available with such spaces, and the potential advantage of co-teaching with colleagues who may have more experience of supporting students with learning problems. Those with greater experience of flexible learning spaces also

seem more aware of the potential time and management issues needed to make these teaching environments effective. This would fit with the need for additional planning that is often of primary importance when working with low progress learners, particularly those with varying types of learning difficulties (see discussions in Reid, Elbeheri & Everatt, 2015) – hopefully, the additional time and management will include a focus on those with specific needs. The evidence that these concerns do not show interactions across decile or ethnic composition of schools argues for them being seen as important by staff from a range of New Zealand primary school backgrounds. This consistency across primary schools would be worthy of further investigation, but is in line with concerns being viewed as issues for children with learning difficulties rather than due to potential limitations in opportunity associated with lower socio-economic status or to cultural backgrounds that may lead to problems integrating within the school system.

Of course, any such research of respondents' views requires some caution in terms of generalisation. A survey of this type would more likely to be answered by those with strong opinions on the subject outlined in the introduction to the questionnaire. Hence, it may be the case that more moderate views would be found through other research methods. Similarly, although the use of quantitative and qualitative data can reduce some of the risks to validity that only one type of data may present, both quantitative and qualitative analyses involved interpretation by the same researchers, meaning that interpretation of one set of data is likely to be associated with the interpretation of the second. For example, a finding in the quantitative data may be more likely to be seen as a concept in the qualitative analyses. Even though the quantitative and qualitative analyses were performed by different researchers, they came at the data from a similar theoretical understanding of the statements in the questionnaire. However, the generally cautious positive responses of participants in the current survey were consistent with those of more in-depth case-study procedures incorporated in research by Mackey, O'Reilly, Fletcher and Jansen (2017) in New Zealand; though this previous study did not consider specific views related to children with difficulties in literacy and mathematics. Further research considering different samples would, therefore, be worthwhile. This would be even more worthwhile if the views of the students themselves were incorporated into the data collection; and possibly data contrasting students with varying levels of literacy/mathematics achievement across the different types of learning environments covered in the present study. It would be of particular interest to combine the soliciting of self-perceptions with direct classroom observation to better understand if learners who have been identified as having specific learning difficulties, such as those with dyslexia, 'would be able to focus/concentrate on curriculum tasks on a sustained basis when there are multiple activities happening in these large learning spaces.

Therefore, to conclude, although there are positive signs from staff within New Zealand for the growth of Innovative Learning Environments, there are also challenges that both future research and practice will need to consider. This will certainly be the case when considering students who struggle with learning. The task will be to build on the benefits

and reduce the specific challenges associated with different learning environments; and the work in New Zealand over the coming years has the potential to inform practice in how to better accomplish this vital educational task.

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