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Factors in Instructional Decision-Making, Ratings of Evidence and Intended Instructional Practices of Australian Final Year Teacher Education Students

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Abstract: There has been increasing interest in an evidence-based approach to education in Australia, but relatively little research has provided relevant data on knowledge of the evidence base for instructional practices among teachers preparing to enter the profession. Final year teacher education students (N = 290) in 15 Australian tertiary institutions were surveyed on their understanding of the strength of evidence for 14 instructional strategies and their intended frequency of use of the strategies following graduation. They were also asked to rate the importance of factors they considered in instructional decision-making. Empirical evidence was important in selection of instructional practices but personal preference and, in particular, practicum experiences were considered more important. Students were very confident in their ability to make judgements regarding the evidence base for a range of instructional strategies and tended to rate all strategies as relatively effective. Their judgements, however, did not correlate strongly with available evidence. Intended use of strategies correlated highly with strength of evidence ratings. Implications of these findings for teacher preparation and future research are considered.

Keywords: evidence-based practice, teacher education students, instructional practices.

Introduction

The presence of a research to practice gap in education is widely asserted (e.g., Everett, Luera, & Otto, 2008; Gable, Tonelson, Sheth, Wilson, & Park, 2012; Jones, 2009) and in this context, there has been increasing interest in the concept of evidence-based practice in education in Australia (Centre for Education Statistics and Evaluation, 2013; Rowe, 2005; Stephenson, Carter, & O'Neill, 2013). The Australian Institute for Teaching and School Leadership (2011), which accredits teacher education courses in Australian tertiary institutions, is committed to building on research evidence about "what works in teacher education" (p. 3) and has noted that teacher education programs should take account of "authoritative educational research findings" (p. 12). Ingvarson and Rowe (2008) have argued that teachers are the most valuable resources available to schools, and the goal of raising the quality of teaching "can only be realised by ensuring that teachers are equipped with subject-matter knowledge and an evidence- and standards-based repertoire of pedagogical skills that are demonstrably effective in meeting the developmental and learning needs of all students" (p.6).

Factors Considered in Instructional Decision-Making

The extent to which practicing teachers rely on research in their instructional decision-making has been examined from several perspectives. A review by Rudland and Kemp (2004) provided examination of the professional reading habits of teachers. They concluded that teachers engaged in relatively little professional reading in comparison with other professions. Further, the reading of teachers tended to be of a pragmatic nature rather than research focused. In light of this finding, an obvious question would be what factors teachers consider in instructional decision-making. Landrum, Cook, Tankersley, and Fitzgerald (2002) provide some insight into this issue. They examined the views of student teachers nearing the end of their courses in two North American universities. Landrum et al. reported that respondents considered the opinions of colleagues, workshops and in-service programs were more accessible, usable and trustworthy than professional journals. An interesting study by Foegen, Espin, Allinder, and Markell (2001) provided evidence that pre-service teachers' views on the validity and utility of curriculum-based measurement, a specific type of formative evaluation, was not increased by presentation of statistical information, as compared with anecdotal first-person accounts. Thus, there is some evidence to suggest that both practicing teachers and those in preparation may not regard research as fundamentally relevant to instructional decision-making.

Knowledge of Evidence-Based Practices

There are a number of studies that have examined working teachers' knowledge of evidence-based practices but these have tended to focus on narrow student groups, very restricted geographical areas or specific professional groups. For example, Gable, Tonelson, Sheth, Wilson, and Park (2012) examined rated importance, reported use and level of preparation in practicing North American teachers with respect to 20 evidence-based practices for students with emotional disabilities. A number of evidence-based practices were not in common use and teachers indicated a lack of adequate preparation on important strategies, including function-based interventions. Gable et al. (2012) concluded that there appeared to be a substantial research to practice gap for both special education teachers and general education teachers working with children with emotional disabilities. Similarly, Stormont, Reinke, and Herman (2011) surveyed 239 early childhood and elementary regular education teachers from five US school districts on 10 intervention approaches with extensive empirical support in addressing the needs of students with emotional and behavioural problems. They found that over 80% of teachers had not heard of nine approaches and 10% or less of teachers agreed or strongly agreed that the approaches were evidence-based. Burns and Ysseldyke (2009) and Carter, Strnadová, and Stephenson (2012) examined the reported level of implementation of eight instructional practices by special education teachers in the United States and Czech Republic respectively. In both studies there were moderate to high levels of reported use of all practices, including those with little empirical support that could not be considered evidence-based.

In addition to this international research, there have been a number of Australian studies examining teacher knowledge or implementation of evidence-based practices. In a replication of the previously mentioned study of Burns and Ysseldyke (2009), Carter, Stephenson, and Strnadová (2011) examined the reported use of evidence and non-evidence-based instructional practices by special educators, with broadly similar findings. Demant and Yates (2003) examined knowledge and attitudes of 58 Australian primary teachers to the direct instruction construct, which has a strong research base. They found that teachers

tended to have generally positive attitudes, which tended to correlate with more accurate knowledge.

Thus, existing research with practicing teachers has tended to focus on specific professional groups (such as special education teachers) or practices related to particular student groups (such as those with emotional difficulties). In addition, researchers have tended to focus on issues such as reported familiarity with procedures or reported implementation. Largely missing from these data has been examination of teacher knowledge of the research base for these procedures. Given that the interest in evidence-based practice, both internationally and in Australia, has been relatively recent, it is certainly possible that findings from practicing teachers may not hold for students currently in teacher preparation programs, particularly those approaching graduation. Given recent emphasis on the need for Australian teacher education programs to incorporate a more extensive understanding of research into effective pedagogy (Australian Institute for Teaching and School Leadership, 2011; Rowe, 2005; Ingvarson & Rowe, 2008), an increasing focus on the evidence base supporting common instructional practices might be anticipated.

There has only been limited research conducted with student teachers relevant to their knowledge of evidence-based practices. Bain, Brown, and Jordan (2009) examined the accuracy of beliefs regarding childhood interventions of teacher candidates (n=351) who were at various levels in training. Participants were asked about specific (a) evidence-based practices, (b) controversial practices, and (c) practices that lacked evidence or that evidence demonstrated were ineffective. The practices were relevant to children with autism, ADHD or dyslexia, and an explanatory statement was provided with each intervention. With regard to effectiveness beliefs, Bain et al. (2009) reported that evidence-based interventions tended to be endorsed at high levels, but this was also true of some non-evidence-based interventions. Bain et al. (2009) noted that "endorsement rates across interventions varied but not in a consistently logical manner" (p. 85). All non-evidence-based interventions were endorsed as effective by more than a quarter of respondents (including some that are dangerous, such as vaccine withdrawal and chelation therapy for autism). It was also notable that many respondents tended to endorse interventions as effective, even though they acknowledged that they had not had previous knowledge or exposure. There was no consistent evidence of improvement in judgement as trainees move closer to licensure. It should be noted that this study was limited to a single North American institution and some of the interventions examined were not educational in nature.

In an Australian study of pre-service teachers, primarily focussing on issues of self-efficacy, Main and Hammond (2008) noted that teachers had limited knowledge of several important empirically verified behaviour management strategies, including functional behavioural assessment. Similarly, O'Neill and Stephenson (2011, 2012a, 2014) reported that the classroom and behaviour management content of pre-service primary teacher education programs often included superficial coverage of a large number of theoretical models and lacked coverage of evidence-based models. The teaching of reading in Australia has also been examined in relation to teacher knowledge and implementation of research-based practice in early literacy and questions have been raised regarding the level of knowledge of pre-service and beginning primary teachers (Louden & Rohl, 2006; Mahar & Richdale, 2008). Nevertheless, as far as can be ascertained, there are no Australian studies that explore the knowledge of research support for broad a range of instructional practices with pre-service teachers. Although there are many survey studies of pre-service teachers, there are relatively few that have surveyed students across multiple universities.

In summary, existing research has typically focussed on awareness and reported implementation of interventions with circumscribed groups of practicing teachers in limited geographical areas. Given the emergence of evidence-based practice in recent years, the

relevant findings may not hold for teachers who are currently in preparation. Research on student teacher views on evidence-based practice is limited. In particular, there appears to be very limited data on teacher or student teacher knowledge of the research base for instructional practices. The main purpose of the current study was to examine the views of final year Australian pre-service trainee teachers regarding the level of research support for a variety of instructional practices. The specific research questions were:

1. How do final year student teachers rate factors (research evidence, personal style, teacher preparation programs, advice from teachers, practicum experience) as influencing decisions regarding instructional practices?
2. How do final year student teachers rate the research evidence for effectiveness of instructional practices with varying levels of empirical support?
3. At what frequency do final year student teachers anticipate using instructional practices with varying levels of empirical support?
4. What is the relationship between student teacher ratings of research support and empirical evidence for common instructional practices?
5. What is the relationship between ratings of effectiveness and anticipated frequency of use of common instructional practices?

Method

Survey

A three-part online survey was constructed and made available via the SurveyMonkey platform. Completion of all relevant responses was mandatory before moving from one page of the survey to the next. The first part of the survey provided demographic background and included questions addressing: gender; the level of program in which the student was currently enrolled (bachelor, graduate diploma, masters, other); the area of teaching (primary, secondary, special education, other); the area of secondary teaching if relevant; how long before the student completed their course (less than six months, between six months and one year, more than one year); and whether the current course was the first tertiary qualification. The question regarding the length of time before course completion was included to verify that respondents were eligible for the survey (i.e., in the final year of their program of study).

The second part of the survey consisted of seven questions. The first asked "How important do you think it is to use instructional practices that have been shown by empirical research to be effective? In this context, the term empirical research involves testing effectiveness of practices using experiments in which student performance is measured." The remaining six questions asked about the importance of varying factors (personal philosophy and style, advice of other teachers, research, content of education course, practicum experience) in deciding on which instructional practices teachers would use in the classroom. The two items related to research were to allow differentiation between empirical research and educational research more generally. In all cases, students were asked to respond on a five-point Likert type scale with responses ranging from *very important* to *very unimportant.*

In the final part of the survey students were presented with a list of 14 instructional practices along with a brief definition of each. In relation to each practice, students were asked to indicate "(a) How strong do you think the research evidence is for this instructional practice? If you are uncertain, click the "unsure" option." Students responded on a five-point Likert-type scale with options ranging from *very strong* to *very weak*. In addition, an "*unsure*" option was provided to accommodate respondents who did not consider that they had sufficient knowledge of the instructional practice to make a judgement. Further, students

were asked to indicate "(b) How frequently do you anticipate you will use this practice in your teaching when you graduate? If you are uncertain, click the *unsure* option." In relation to frequency of use the following statement was added "Some of the practices may not be relevant to your area of teaching so you should rate these as Never for frequency." Students were presented with ordinal response options (*very frequently, frequently, sometimes, infrequently, never*) with the additional option of *unsure*.

Thirteen of the practices were selected from the synthesis of meta-analyses relevant to educational achievement conducted by Hattie (2009) that provided evaluation of approximately 800 meta-analyses, 52,637 studies and approximately 236 million students. Hattie (2009) argued that provision of teaching and maturation affects could account for effect sizes of up to approximately 0.40 and that this should be regarded as a "hinge point" for judging the effectiveness of educational interventions. Eight strategies that could be clearly defined with effect sizes well above this hinge point (0.55 - 0.90) were selected as evidence-based practices. Conversely, six strategies with effect sizes near or below the hinge point (0.06 - 0.41) were considered as non-evidence-based practices. In each case, the definition of the practice was based on the description provided by Hattie (2009). A list of the strategies selected, definitions presented and the effect sizes reported by Hattie (2009) is presented in Table 1. Although learning styles instruction (0.41) was close to the hinge point, Hattie (2009) was critical of procedures and interpretation in many of the meta-analyses. Further, several other reviewers (Kavale & Forness, 1999; Landrum & McDuffie, 2010; Pashler, McDaniel, Rohrer, & Bjork, 2008) have failed to find convincing evidence to support the use of learning styles in education and consequently it was classified as a non evidence-based practice for the purposes of this study. In addition, the concept of multiple intelligences (Gardner, 1993) appears to be widely discussed in education but was not examined by Hattie. The theory has been heavily criticized for its lack of supporting empirical evidence and problematic interpretation in terms of educational practice (Dekker, Lee, Howard-Jones, & Jolles, 2012; Klein, 1997; Waterhouse, 2006a; Waterhouse, 2006b). Thus, multiple intelligences was included as a potential instructional strategy that lacks an adequate evidence base.

Intervention	Class	Definition	ES
Multiple Intelligences	Non evidence-based	Teaching that considers and accommodates multiple intelligences (i.e., musical, bodily- kinaesthetic, logical-mathematical, linguistic, spatial, interpersonal, intrapersonal, naturalistic).	NA
Inquiry-Based Teaching	Non evidence-based	Involves developing challenging situations where students observe and question, postulate explanations, devise and conduct experiments, analyse data, draw conclusions and build models. Tasks are open-ended and there is no single "right" answer.	0.33
Meta-cognitive Strategies (strategy instruction)	Evidence-based	Interventions that address higher-order thinking, involving active control over cognitive processes. Strategies may include verbal self-instruction, self- evaluation and self-monitoring.	0.69
Perceptual-motor Programs	Non evidence-based	Improving academic performance by addressing perceptual and motor skills such as visual-motor abilities, physical coordination, balance activities and body awareness.	0.08
Problem-based Learning	Non evidence-based	Student centred learning occurs in small groups with a facilitator. Authentic problems are presented to develop required knowledge and problem solving skills. New information is acquired through self-directed learning.	0.15
Learning Styles Instruction (modality based)	Non evidence-based	This involves assessing the learner's style of learning (i.e., visual, auditory, kinaesthetic) and matching instruction to the patterns of strength and weakness. For example, visual strategies might be emphasised with visual learners, auditory strategies might be emphasised with auditory learners and hands-on activities emphasised with kinaesthetic learners).	0.41
Peer Tutoring	Evidence-based	The systematic use of students to act as tutors for other students.	0.55
Setting Goals	Evidence-based	Clear goals are set for student performance.	0.56
Reading Comprehension Programs	Evidence-based	The use of activities to attempt to improve comprehension of written text. May include strategies such as asking questions during reading and summarising text.	0.58
Mastery Learning	Evidence-based	Mastery learning involves setting clear performance standards, regular testing of student learning as well as supplementary teaching of students who do not attain the required level of mastery.	0.58
Direct Instruction	Evidence-based	Structured instruction involving setting clear objectives, structured, clear and explicit teaching, regular checking of understanding, guided practice and independent practice.	0.59
Whole Language Reading	Non evidence-based	Reading instruction based on the concept that acquisition of reading skills is primarily dependent on context and words are learned more easily in the context of the words around them and the story.	0.06
Phonics instruction	Evidence-based	The systematic teaching of the alphabetic code (letter-sound correspondence) and how to use this knowledge to read words.	0.60
Formative Evaluation	Evidence-based	Systematic and regular testing of student performance (typically at least twice a week) while they are learning (as opposed to after completion of instruction).	0.90

Table 1: Instructional Strategies

Note: ES - Cohen's *d* effect sizes are reported by Hattie (2009

Procedures

Following approval by the Human Research Ethics Committee, an information letter and consent form was forwarded to the Dean or relevant Head of Department of publicly funded Australian universities providing initial teacher education programs. In addition, the federal government Department of Education, Employment and Workplace Relations (n.d.) Commonwealth Register of Institutions and Courses for Overseas Students website was searched to assist in identifying additional approved private institutions that provided initial teacher education programs. A total of 48 institutions were identified as offering relevant programs.

The information and consent letter consisted of a brief description of the research and institutional consent form. Consenting institutions were asked to distribute the link to all students in their final year of study via email, provide information on the number of final year students and provide a contact person regarding distribution. In the case of one institution, total possible participant numbers were estimated from graduation lists in the subsequent year. A reminder letter was sent to non-responding institutions four to eight weeks after the initial introductory letter.

Once institutional approval was obtained, a recruitment notice was sent to students, providing the link to the survey along with a brief description of the research. Consistent with the ethics approval, students were also given the option of entering a draw for one of four incentive prizes on completion of the survey. Students were notified that the survey would close in four weeks. After two weeks, a reminder notice was forwarded to potential participants.

Results

A total of 15 (31%) of institutions consented to participate in the study and the total number of potential respondents was 3193 according to the information provided. Responses were received from 300 students but 10 of these were ineligible as they indicated they had more than 1 year left to complete their course of study, leaving a total of 290 responses and a response rate of 9.1%. Demographic characteristics of the sample are summarised in Table 2. In response to the question regarding level of program, four students selected the "other" option but, on examination, all of these responses could be reclassified into the alternative categories. Of the 23 respondents who selected *other* for the teaching area, 12 indicated that they were completing a combined early childhood and primary teaching program. Numerous secondary teaching areas were identified and many students identified multiple areas. Only teaching areas identified by more than 10 respondents are reported in Table 2.

Information relating to Part 2 of the survey is provided in Table 3. Data are presented on the number of participants selecting each response option. In addition, the data were ranked across factors for each responding participant (n = 271) and the mean of each ranking across participants was calculated for each decision-making factor. Probably the most striking feature of these data was the number of very important ratings for practicum experience. Ordinal values from 1 (*very important*) to 5 (*very unimportant*) were assigned to ratings and *unsure* responses were treated as missing data for the purpose of analysis. A Friedman two-way analysis of variance (Stricker, 2008) was conducted to determine whether decision-making factors were ranked differently by participants. There were significant differences in the rankings, $\chi^2(5, N = 271) = 199.38$, $p < .0001$, so Conover post hoc comparisons were completed. The results of these paired comparisons and mean ranking differences between interventions are presented in Table 4. All differences were significant

except for those between (a) empirical research and current teacher preparation, (b) teacher advice and research, and (c) teacher advice and teacher preparation.

Data relating to ranking of the strength of evidence are presented in Table 5. Data are presented on the number of participants selecting each response option. In addition, the data were ranked across practices for each participant who provided a rating for all 14 practices (i.e., no "unsure" responses; n = 153) and the mean of each ranking across participants was calculated for each instructional practice.

Ordinal values from 1 (very strong) to 5 (very weak) were assigned to ratings and "unsure" responses were treated as missing data for the purpose of analysis. A Friedman two-way analysis of variance (Stricker, 2008) was conducted to determine whether evidence for practices was ranked differently by participants. There were significant differences in the rankings, $\chi^2(13, N = 153) = 236.43$, $p < .0001$, so Conover post hoc comparisons were completed. The results of these paired comparisons and mean ranking differences between interventions is presented in Table 6. Formative evaluation was ranked significantly higher than two non-evidence-based practices and significantly lower than one non-evidence-based practice. Meta-cognitive strategy instruction was ranked significantly higher than two non-evidence-based practices. Phonics instruction for reading was rated significantly higher than one non-evidence-based practice but significantly lower than four others. Interestingly, phonics instruction was not ranked differently to whole language reading instruction. Direct instruction was ranked significantly higher than three non-evidence-based practices. Mastery learning was ranked higher than one non-evidence-based practice and significantly lower than the remaining five non-evidence-based practices. Reading comprehension programs and setting goals were both ranked significantly higher than three non-evidence-based practices. Finally, peer tutoring ranked significantly lower than five non-evidence-based practices and significantly higher than the remaining practice. A Pearson correlation was calculated between mean ranking for evidence and Hattie's (2009) calculated effect size for the 13 relevant practices. Since a lower mean ranking score indicates greater perceived evidence, a negative correlation reflects greater agreement. The calculated correlation was -0.31 (t = -1.05, p = 0.32).

Data relating to ranking of proposed frequency of use of strategies are presented in Table 7. Data are presented on the number of participants selecting each response option. In addition, the data were ranked across practices for each participant who provided a frequency rating for all practices (i.e., no "unsure" responses; n = 159) and the mean of each ranking across participants was calculated for each instructional practice.

Ordinal values from 1 (very frequently) to 5 (never) were assigned to ratings and "unsure" responses were treated as missing data for the purposed of analysis. A Pearson correlation was calculated between mean evidence and frequency ratings for each relevant practice (r = .93, t = 8.81, $p < 0.001$). This indicated a very strong relationship between the rating of evidence and planned frequency of use of practices.

Characteristic	*n*
Gender	
Female	217
Male	73
Age (years)	
Median	25
Mean	29
SD	8.8
Level of Program	
Bachelor degree	202
Graduate Diploma	61
Masters	23
* Teaching Area	
Primary	148
Secondary	141
Special Education	7
Other	23
Secondary Teaching Areas	
One teaching area	50
More than one teaching area	86
**Secondary Teaching Areas (>10 respondents)	
English	35
Science	28
Religion	21
PDHPE	20
History	15
Art	14
Mathematics	14
Time to Complete Qualification	
Less than 6 months	266
6 months to 1 year	24
First Qualification	
Yes	168
No	122
*** Previous qualifications	
Technical and Further Education (TAFE)	7
Bachelor Degree	90
Masters Degree	7
Doctoral Degree	1
Other	2

Table 2: Sample Demographics

Note. * Responses allowed in multiple categories; ** Open-ended responses; *** Open-ended responses. Seven participants had both Master and Bachelor degree.

	Very Important	Important	Neither important or unimportant	Unimportant	Very Unimportant	No response	Mean Rank
How important do you think it is to use instructional practices that have been shown by empirical research to be effective? In this context, the term empirical research involves testing effectiveness of practices using experiments in which student performance is measured.	102	147	19	1	2	19	3.54
How important is it for a teacher to use instructional practices that accord with their personal philosophy and style of teaching?	131	123	10	5	2	19	3.25
How important to you is the advice of other teachers in deciding which instructional practices you will use in the classroom?	70	173	23	4	1	19	3.93
How important is research in deciding which instructional practices you will use in the classroom?	73	154	32	9	3	19	4.02
How important is the content of your current teacher preparation course in deciding which instructional practices you will use in the classroom?	96	134	28	12	1	19	3.77
How important is your practicum experience in deciding which instructional practices you will use in the classroom?	202	61	7	0	1	19	2.48

Table 3: Descriptive Data on Importance of Factors in Instructional Decision-Making

	Empirical Research	Philosophy and Style	Advice Teachers	Research	Current Teacher Preparation
Philosophy and style	0.29*				
Advice Teachers	-0.39**	-0.68***			
Research	-0.48***	-0.77***	-0.09		
Current Teacher Preparation	-0.23	-0.52***	0.16	0.25*	
Practicum Experience	1.07***	0.77***	1.45***	1.55***	1.29***

Table 4: Friedman Post Hoc Analysis and Mean Rank Differences for Factors in Instructional Decision-Making

Note. * p<0.05, ** p<0.01, *** p<0.001; positive values indicate higher ranking for factors listed in first column.

	Very Strong	Strong	Neutral	Weak	Very Weak	Unsure	Mean Rank
Multiple Intelligences	80	101	35	10	0	9	6.7
Inquiry-Based Learning	89	113	22	3	1	7	6.4
Meta-Cognitive Strategies (strategy instruction)	49	104	60	10	3	9	7.0
Problem-Based Learning	72	121	32	2	0	8	6.9
Peer Tutoring	45	95	71	9	1	14	9.0
Perceptual Motor Programs	25	72	68	14	5	51	10.0
Setting Goals	104	100	26	1	0	4	6.3
Reading Comprehension Programs	95	90	30	4	3	13	6.3
Learning Styles Instruction	82	96	40	4	2	11	7.3
Mastery Learning	41	85	69	12	2	26	9.2
Direct Instruction	105	97	22	6	0	5	6.2
Whole Language Reading	46	97	47	9	2	34	8.3
Phonics Instruction	57	87	42	10	4	35	8.3
Formative Evaluation	89	83	40	7	2	14	7.3

Table 5: Descriptive Data on Ratings of Evidence for Instructional Practices

	Multiple Intelligences	Inquiry-Based Learning	Meta-Cognitive Strategies	Problem-Based Learning	Peer Tutoring	Perceptual Motor Programs	Setting Goals	Reading Comprehension Programs	Learning Styles Instruction	Mastery Learning	Direct Instruction	Whole Language Reading	Phonics Instruction
Inquiry-Based Learning	0.34												
Meta-Cognitive Strategies	-0.27	-0.61											
Problem-Based Learning	-0.17	-0.51	0.11										
Peer Tutoring	-2.3***	-2.64***	-2.03***	-2.13***									
Perceptual Motor Programs	-3.28***	-3.62***	-3.00***	-3.11***	-0.98*								
Setting Goals	0.37	0.03	0.64	0.53	2.67***	3.64***							
Reading Comprehension Programs	0.42	0.08	0.69	0.58	2.72***	3.70***	0.05						
Learning Styles Instruction	-0.58	-0.92*	-0.31	-0.42	1.72***	2.69***	-0.95*	-1.00**					
Mastery Learning	-2.51***	-2.85***	-2.24***	-2.34***	-0.21	0.77*	-2.88***	-2.93***	-1.92***				
Direct Instruction	0.45	0.11	0.73	0.62	2.75***	3.73***	0.09	0.04	1.04**	2.96***			
Whole Language Reading	-1.56***	-1.90***	-1.29***	-1.40***	0.74	1.72***	-1.93***	-1.98***	-0.98*	0.95*	-2.02***		
Phonics Instruction	-1.63***	-1.97***	-1.35***	-1.46***	0.67	1.65***	-1.99***	-2.05***	-1.04**	0.88*	-2.08***	-0.07	
Formative Evaluation	-0.58	-0.92*	-0.30	-0.41	1.73***	2.70***	-0.94*	-0.99**	0.01	1.93***	-1.03**	0.99*	1.05**

Table 6: Friedman Post Hoc Analysis and Mean Rank Differences for Ratings for Research Evidence

Note. * p<0.05, ** p<0.01, *** p<0.001; positive values indicate higher ranking for practices listed first column.

	Very Frequent	Frequent	Sometimes	Infrequently	Never	Unsure	Mean Rank
Multiple Intelligences	54	91	66	17	1	6	7.3
Inquiry-Based Learning	68	108	45	8	2	4	6.4
Meta-Cognitive Strategies (strategy instruction)	49	104	60	10	3	9	7.3
Problem-Based Learning	55	97	71	7	0	5	7.0
Peer Tutoring	32	59	101	29	7	7	9.2
Perceptual Motor Programs	21	42	80	43	13	36	10.4
Setting Goals	118	84	27	5	0	1	5.5
Reading Comprehension Programs	93	86	28	13	5	10	5.8
Learning Styles Instruction	64	83	62	15	3	8	7.3
Mastery Learning	24	67	91	27	2	24	9.4
Direct Instruction	96	96	35	6	1	1	5.9
Whole Language Reading	50	67	63	19	9	27	8.0
Phonics Instruction	43	68	51	22	22	29	8.6
Formative Evaluation	65	95	47	17	2	9	7.0

Table 7: Descriptive Data on Ratings of Frequency for Instructional Practices

Discussion

Instructional Decision-Making

In interpreting data in instructional decision-making, it should be noted that most factors were considered “very important” or “important” by the vast majority of participants, with distribution between these two ratings determining rankings. Nevertheless, practicum experience was highest ranked by a substantial margin and was significantly higher than all other factors. Accommodating personal philosophy and style was second ranked, significantly higher than all other factors except practicum. The third highest ranked factor was empirical research, which was significantly higher than teacher preparation programs, advice from other teachers and research in general. Although it is arguably encouraging to see empirical evidence ranked higher than such factors as teacher advice, it was still ranked lower than practicum experience and personal philosophy and style. Carnine (2000, p. 9) has argued that a “ mature profession … is characterized by a shift from judgments of individual experts to judgments constrained by quantified data that can be inspected by a broad audience, less emphasis on personal trust and more on objectivity”. By this standard, the present data would suggest that education might have some way to travel before becoming a mature profession. The data presented in the current study indicates that teachers may be continuing to place greater weighting on personal experience and preferences than evidence.

Interestingly, empirical evidence was rated higher than teacher advice in the current study yet Landrum et al. (2002) reported that late-stage trainee teachers viewed advice as more accessible, usable and trustworthy than professional journals. This apparent discrepancy might be accounted for by the exclusive focus of Landrum et al. (2002) on the source of the information (i.e., professional journals), rather than the nature of the content (empirical research). It was also of note that empirical research was specifically rated higher than research in general in the present study. This may suggest some level of recognition of the importance of such research.

The pre-service teachers in the current study viewed practicum as the most important influence on their instructional decision-making. The important role of practicum experience in shaping student teacher pedagogical understanding has been subject to exploration (e.g., Bronkhorst, Koster, Meijer, Woldman, & Vermunt, 2014; Walton & Rusznyak, 2013). Tetley and Jones (2014) found that exposure to various types of literacy programs during practicum was associated with student teachers' knowledge of scientifically-based language concepts related to reading, providing some corroborative evidence for the perceptive importance of practicum reported in the current study.

In summary, data from the present study would tend to indicate that there is a considerable way to go in attempting to bridge the research to practice gap in education. Although empirical evidence related to student outcomes was considered somewhat important in trainee teacher decision-making, it was still rated as lower than personal preference related to teaching style and much lower than practicum experience. These findings have a number of implications. In the longer term, a greater focus on the role of empirical research might be needed in teacher preparation programs. In the short-term, given the reported prominence of practicum experiences in decision-making, the importance of high quality and evidence-informed mentorship during practicum is highlighted.

Research Evidence and Anticipated use of Practices

Overall, data from teacher ratings of the strength of evidence provided a positive association between mean ranking of evidence and Hattie's (2009) calculated effect sizes but the correlation was only modest. In contrast, mean ranking for evidence and mean ranking for intended frequency of use were highly correlated ($r = 0.93$) indicating that students intended to use strategies they judged as best supported by evidence. In contrast with previous research, students were offered the option of indicating that they were "unsure" in response to evidence (and frequency) rating. It seemed reasonable to expect students might be unfamiliar with some areas (e.g., approaches to reading instruction for many secondary teachers) and forcing a rating in such circumstances seemed inappropriate. Given this, the very high level of confidence of respondents was of particular note. The highest level of "unsure" responses was for perceptual motor programs (22%) with only three other practices exceeding 10% (phonics instruction, 10%; whole language reading, 14%; mastery learning, 11%). Bain et al. (2009) reported that pre-service teachers tended to endorse described interventions despite acknowledged lack of prior knowledge or exposure. Their suggestion that "more attention should be paid to teaching critical evaluation skills as a part of preliminary training of future educators" (p. 71) would appear to be supported by the current study.

It was noticeable that across all instructional practices, very weak and weak ratings were infrequently used. In addition, for all practices, combined very strong and strong ratings exceeded neutral ratings, in most cases by a very wide margin. The belief that instructional practices were effective extended to practices that have consistently weak research support such as perceptual motor programs (Hyatt, Stephenson, & Carter, 2009; Kavale & Mattson, 1983) and modality-based learning styles instruction (Kavale & Forness, 1987; Pashler et al., 2008; Landrum & McDuffie, 2010).

Thus, teachers in the final stages of preparation tended to judge instructional practices as evidence-based, regardless of the actual evidence on effectiveness, and rating of strength correlated strongly with intended frequency of use. These data are not inconsistent with the findings of some other lines of research. For example, Bain et al. (2009) found that endorsement rates by pre-service teachers of evidence and non-evidenced-based practices, related to children with disabilities, did not vary in a consistent or logical manner. Similarly,

studies of reported frequency of use of instructional practices of graduate special education teachers in a number of countries (Burns & Ysseldyke, 2009; Carter et al., 2011; Carter et al., 2012) have indicated that both evidence-based and non-evidence-based practices are simultaneously claimed to be used at moderate to high levels.

The possible reasons for the lack of differentiation in judgement regarding the empirical evidence-based for the instructional practices examined in the present study is open to speculation. It is possible that the diversification of curriculum demands, particularly for primary teachers, may mean that limited attention is being directed to examining efficacy research. It is also possible that teacher preparation programs may direct student attention to more effective techniques but, as a result of time constraints, fail to adequately highlight procedures that have weak evidence (Carter et al., 2011). It has also been suggested that teacher preparation programs may not adequately provide teachers with the tools to make judgements regarding evidence-based interventions (Everett et al., 2008; Jones, 2009). In addition, noting that much of the pressure for a move to empirical evidence-based practices has come from sources external to the profession, it is possible that the level of commitment to evidence-based practice within the teacher preparation sector may be more circumspect. Finally, teaching is perhaps unique as a profession as prospective teachers typically have more than a decade of exposure to teaching practices prior to any formal professional training (Everett et al., 2008). Teachers in preparation may tend to interpret evidence through the lens of their own experience as students rather than examining empirical research evidence. The present study was not designed to offer insights into this issue but this should be considered a priority for future research.

Limitations

A limitation of the present research was the low response rate. Only 31% of institutions consented to participate in the research. In a small number of cases, explanations were offered such as the large number of research studies in which students were invited to participate or that students would be unlikely to be monitoring student email due to breaks and practicum. Nevertheless, the low participation rate was surprising given the limited demands placed on institutions.

In addition, the response rate from students was only around 10%. O'Neill and Stephenson (2012b), who also recruited through email invitations, reported a comparable return rate of 14.2%. Response rates from internet surveys can be low (Monroe & Adams, 2012) and, despite strategies to maximize responses such as a follow-up letter and incentive prize, this was the case in the present study. It was not possible to determine how actively students monitored their student email addresses and, consequently, how many received the invitations. Thus, as is often the case in survey research, caution must be exercised in interpreting results due to possible bias in participant selection. It should also be noted that data regarding implementation was based on reported intent and it is not known how this may correspond to actual implementation.

Finally, Hattie's (2009) synthesis of meta-analyses was used for evaluation of the strength of evidence for instructional practices. This is a somewhat blunt measure and Hattie has noted that his intent was to provide an "explanatory story" and weave practices into a coherent narrative to give general flavour of the types of instruction that are more likely to be effective. As such, and given the often poor quality of educational research (Everett et al., 2008), conclusions regarding specific educational practices should be treated with a degree of caution. Although it can be argued that Hattie gives a reasonable broad brushstroke overview

of our current state of knowledge, this is certainly not definitive and may change as more and higher quality data become available.

Conclusion

The present study has suggested that while students believe empirical evidence is important in selection of instructional practices, personal preference and in particular practicum experience are considered more important factors. Given the reported prominence of practicum experiences in decision-making, the importance of high quality and evidence-informed mentorship during practicum is highlighted. Final year student teachers tended to rate most practices as having a strong or very strong evidence base. Relatively few respondents indicated that they were unsure regarding the level of evidence for practices, suggesting a high level of confidence in their knowledge. Nevertheless, there was only a modest correlation between mean student evidence ranking and Hattie's (2009) effect sizes. Further, absolute ratings of evidence strength often did not correspond well with available empirical evidence. The difficulty that students encountered in differentiating evidence-based from non-evidence-based practices suggests that further progress needs to be made if education wishes to become a truly evidence-based profession.

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