

Special Education Funding Reform: A Review of Impact Studies

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Various models for funding special education services have been described in the literature. This paper aims at moving the debate concerning special education funding reform beyond the descriptive level by reviewing studies that investigated the impact of various models for funding special education. Systematic searches were conducted of ERIC and PsycINFO to identify studies that investigated the impact, implications, or outcome of one or more special education funding models. Ten studies were identified covering five major funding models. The results showed that the funding reforms investigated in these studies each had associated benefits, but also potential detriments. However, these studies mainly involved indirect outcome measures, often failed to fully assess impact on academic achievement or cost-effectiveness. Results highlight the need for additional research on the impact of special education funding reform.

Keywords: special education, funding models, voucher programs, category-based funding

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Approximately 8% to 12% of the school-aged population present with special educational needs (SEN) due to an identified disability (Horn & Tynan, 2001; Jordan, 2001). The special educational needs of students with identified disabilities can stem from a variety of disabling conditions, including: (a) behavioural and emotional disorders, (b) developmental, physical, and intellectual disabilities, (c) hearing and vision impairment, (d) specific learning disabilities, and (e) other recognised health or disability conditions, such as attention deficit disorder and attention deficit hyperactivity disorder. Students with these types of identified disabilities represent a large percentage of the individuals who receive special education services in public (State) schools (Dempsey, Foreman, & Jenkinson, 2002).

It is recognised that the criteria for some of these diagnostic categories are not necessarily always clear nor consistently applied (Reschly, 1996). Consequently, there may be some students receiving special education, or considered eligible for such services, who do not necessarily have any type of health-related condition or identified disability. Low achieving students, for example, might be classified as learning

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disabled so that they can then qualify for special education funding to finance their remedial tuition (Horn & Tynan, 2001). Other students might be at risk for academic failure — and therefore in need of special education — due to a variety of sociocultural reasons, such as poor academic preparation, ineffective teaching, and economic disadvantage. These students are sometimes identified as having SEN so that their school can then receive extra funding to provide the required special education services (Carlson & O'Reilly, 1996; Evans, Docking, & Evans, 1997).

Increasingly, the trend is for children with SEN to be included to varying degrees in the mainstream educational classroom (Dempsey et al., 2002; Dyson, 2004); a model of service provision variously known as inclusion, inclusive education, mainstreaming, or the regular education initiative (Mostert, 1991; Topping & Maloney, 2005). While closer links between regular and special education are potential outcomes of the inclusive education movement, it appears that funding arrangements for special education and related services are often kept administratively separate from the mechanisms that govern fiscal resources for general education (Moore-Brown, 2001).

There could be several reasons for this dichotomy of funding arrangements between special and regular education. One plausible reason, as Kauffman (1999) noted, is that historically, special education services have often been reserved for students with identified disabilities. Because of their disabilities, these students were considered to have a clear and justifiable need for extra resources and specialised interventions over and above that provided to nondisabled students in the regular classroom (Pijl & Dyson, 1998). These specialised services are often viewed as entitlements that should be reserved for students meeting predetermined eligibility requirements, with the funding for these entitlements directed only towards students identified as eligible and placed in special education (Reschly, 1996). These historical factors could have made it logical, desirable, and indeed seemingly necessary to create separate budgetary arrangements that would ensure extra funding was appropriately directed to support the educational needs of eligible students.

Whatever the reasons, the use of separate funding streams for regular versus special education has often revealed that special education is more expensive than regular education. Indeed, it has been estimated that special education costs at least twice as much as regular education (Jordan, Weiner, & Forbis Jordan, 1997; Parrish, 2000). In addition, the costs associated with SEN appear to be escalating (Hartman, 2001; Horn & Tynan, 2001).

When seen as the provision of extra services involving specialised interventions over and above that provided to typical students in regular classrooms, it is understandable that special education would be more costly than regular education. However, the rising costs have led to calls for reform in relation to special education funding. Parrish (2000) noted that special education funding reforms are being driven by several themes, including: (a) rising costs associated with special education, (b) concerns over the efficiency with which resources are used, and (c) the extent to which funding formula provide incentives for contraindicated practices, such as exclusion from mainstream and over-referral into special education.

While there could be several reasons for the differential and rising costs of special versus regular education, there would seem to be a clear public policy imperative to consider reforms in special education funding. Funding reform should aim at facilitating the design and effective implementation of models or approaches that lead to more equitable and economic use of fiscal resources, while at the same time ensuring attainment of agreed educational objectives (Granel, 2002; Hartman, 1992; Parrish &

Chambers, 1996). Along these lines, various models for funding special education services have been described in the literature, including census-based and categorically-based approaches, as well as voucher programs (Etscheidt, 2005; Furney, Hasazi, & Clark-Keffe, 2005).

This review aims at moving the debate concerning special education funding reform beyond the descriptive level by reviewing studies that have sought to investigate the impact of various special education funding models. A review of this type would seem timely given that reform of special education funding models is on the agenda in several countries (Hartman, 2001; Jordan, 2001; Parrish, 2000; Pijl & Dyson, 1998). In addition, developments in the area of evidence-based education dictate that educational policy and practice, including funding models, should be based on the best available evidence of what works (Smith, 2003). To advance evidence-based educational policies related to funding reform, a systematic review of the literature in this area would seem timely. A review of this type might provide a useful starting point for evaluating the evidence and informing educational policy related to special education funding reform. It might also assist policy makers in comparing the evidence base supporting one or more funding models.

Method

Search Procedures

Systematic searches were conducted on ERIC and PsycINFO because these represent the largest and leading databases for special education research. The search was limited to English-language journal articles from 1996 through to 2006. These limiting criteria were used to in an attempt to ensure that the identified studies reflected contemporary funding models. Limiting the search to journal articles also provided a measure of quality assurance because it meant that the identified studies had undergone peer review prior to publication.

On both databases, the terms *Special Education* and *Funding* (or *Funding Models*) were inserted into the Keyword field to increase the probability of capturing relevant publications. Because this search failed to produce articles related to voucher systems, which have been used in the reform of both general (Granell, 2002) and special education systems (Etscheidt, 2005; Richards & White, 1989), we ran separate ERIC and PsycINFO searches with the terms *vouchers* and *special education*. A replication of these searches was then conducted on the Medline and Econlit databases, but no new records were produced.

Inclusion Criteria

The abstract and reference list for each record returned from these searches was then reviewed to identify studies that met the following inclusion criteria. First, the research question(s), aim(s), or main purpose(s) of the study had to relate explicitly to investigating the impact, implications, or outcome of reforms related to one or more special education funding models. The funding reform investigated could relate to special education in general, to one or more specific categories of disability (e.g., physical impairment, deaf education), or to a specific type of special education program (e.g., preschool programs, postsecondary vocational programs). Second, the study had to involve one or more of the following methodological approaches: (a) collection of original data via observation, questionnaire, or interviews, (b) analyses of documents detailing specific reforms or specific policies related to one or more funding models, and/or (c) analyses of existing documentary sources that included data about the impact

or outcomes of one or more funding reforms. Third, studies were included if they involved a descriptive/statistical analysis of trend data related to the costs of special education or effects of funding models on identification and enrollment trends.

Analysis of Studies

Studies meeting the inclusion criteria were summarised using a prepared checklist. The coding procedures involved reading the Introduction to each study to identify the funding model(s) investigated, the purpose of the study, and the specific research questions addressed (not all studies included separate or labeled subsections). Next, the Method section was reviewed to gather information about the participants, settings, and data collection procedures. Third, the Results section was reviewed to determine the major findings or outcomes of the research. Finally, we reviewed the Discussion section of each study to identify the major conclusions that the authors drew from their results. An initial summary of each study was prepared by the first author and then checked by the fourth author to establish interrater agreement. Interrater agreement was assessed by calculating a total agreement score using the formula: $\text{Agreements}/(\text{Agreements} + \text{Disagreements}) \times 100\%$. Total agreement was 90%. There were only four instances of disagreement out of a total of 40 possible agreements plus disagreements. These disagreements were related to (a) whether or not to include one of the 10 studies, (b) whether to classify one of the reforms as an example of a discretionary funding model, and (c) disagreement on the results of two studies. These disagreements were resolved by consensus discussion and reanalysis of the published studies before preparing the final summary of each study (see Table 1).

Results

Search Results

The initial ERIC and PsycINFO searches yielded 76 and 53 respective returns. The second search for voucher-related funding models yielded an additional set of 81 records. From these records, nine studies met the inclusion criterion (i.e., an empirical study investigating one or more special education funding models). One additional study was located from a manual search of the reference lists. Overall, 10 studies were identified that met the inclusion criteria for this review. Table 1 summarises each study.

Funding Models

A number of funding models were investigated in these studies. While the funding models investigated were given various names, these named models appeared to form five broad categories that we classified as either: (a) Discretionary, (b) Categorical, (c) Voucher, (d) Census-based, or (e) Cost-based. It is important to note that these five broad categories are not mutually exclusive. Indeed, most of the specifically named models described by the researchers included features from more than one of these categories. Nonetheless, these five broad categories provide a useful conceptual frame for summarising the range of funding models that were investigated in these 10 studies.

Discretionary funding. Three studies (i.e., Furney, Hasazi, & Clarke-Keffe, 2005; Grigal, Neubert, & Moon, 2001; Naylor, 2001) examined discretionary funding models. These models involved provision of additional funding or a certain budgetary percentage for discretionary [special education] purposes. These budgets were derived either from receipt of additional monies (Furney et al., 2005; Naylor, 2001) or by allocating a set percentage of the school's overall budget to special education (Grigal et al., 2001). In the

TABLE 1
Summary of the Funding Model(s), Methods, and Major Findings/Conclusions for Each Study by Category

Study	Category/Name of funding model	Methods	Findings/conclusion
Category of funding model: Discretionary			
Furney et al. (2005)	Block Grant with Redistribution Model: This approach represents a reform of funding formulas based on local property taxes. Instead of reliance on local property taxes, school districts received a base level block grant. On top of the block grant, funds are redistributed to equalise access to educational resources for students living in less economically advantaged areas. High-spending, property-poor districts, for example, obtain additional funds, whereas funding is reduced for low spending, property-rich towns.	Investigated the impact of the funding reform via analysis of existing departmental databases, interviews, and observations in 65 schools, including schools that had gained, lost, or maintained their level of preriform funding. Ten to 30 interviews were conducted with key informants (e.g., special education coordinator or school principal) in each school. Three to five observations were also completed in each school with observers making field notes. Details of exactly what was observed and how the observations were conducted were not provided.	Schools that gained funds showed increased capacity to support SEN students in general education. Curriculum offerings narrowed and use of alternative placements increased by 40%. Funding reform was associated with benefits and detriments. Curriculum offering and increased use of alternative placements appears to have been more noticeable in schools that lost funds or received less discretionary funding.
Grigal et al. (2001)	Set Budget Percentage: Local schools are allowed to allocate a set percentage (e.g., 20%) of state and/or federal funds for discretionary purposes related to the provision of special education. General guidelines are typically promulgated to exclude certain types of expenditures (e.g., overseas travel, capital works) and allow for other activities more directly related to meeting the educational needs of students with SEN (e.g., innovative SEN programs, professional development in the area of autism).	A questionnaire was developed and used to conduct interviews with teachers from 13 programs. The protocol was first piloted with one teacher and then used to interview the 12 remaining teachers. Additional interviewees included instructional assistants and other staff (e.g., administrators, college liaison personnel) from the 13 programs. All 12 teachers were involved in providing postsecondary programming for 18–21 year old students with SEN. The programs were in Maryland, USA. Local schools operated the programs. Interview protocols canvassed issues related to funding, but details of the exact items in the interview protocol were not provided.	The local schools funded 12 of the 13 programs. Discretionary State funding was available to three programs. The programs were age-appropriate and offered different experiences than high school for 18–21 year olds with SEN. Concluded that evaluations are needed to assess program outcomes.

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TABLE 1 (CONTINUED)
 Summary of the Funding Model(s), Methods, and Major Findings/Conclusions for Each Study by Category

Study	Category/Name of funding model	Methods	Findings/conclusion
Category of funding model: Discretionary			
Naylor (2001)	Student-Focused Funding: Additional funding for specific special education services is provided on top of the funding that is already provided to meet other general aspects of children's education. This additional funding is used for the extra supports and services required for SEN students to achieve their educational goals. The additional funding is intended for high-needs students who require intensive support from specialist teachers.	Descriptive analysis of how \$CAD13 billion of local property taxes and provincial grant revenue was distributed across the 72 school boards serving 2 million students in Ontario, Canada. Allocations were tracked from 1997 to 2000–2001 school year. The analysis considered movement of high-needs students across schools, number of identified students, and administrative costs.	Five percent of the students changed schools each year, which required funding adjustments. The percentage of identified students ranged from 1.47% to 1.60% from 1998–2000. A validation process was used to check accuracy of identified students. While the model was designed to minimise administration by targeting only the most high-needs students, the administrative costs of the validation process were higher than expected.
Category of funding model: Categorically-based			
Jordan (2001)	Category-Based Funding Model: Schools receive a set amount of funding for each student meeting objective diagnostic criteria for prespecified categories of disability. The specific diagnostic categories include intellectual, behavioral, physical, sensory, and multiple disability. The model further specifies that the severity or nature of the disability must be such that the student will require a modified education program for at least some significant portion of the school day (e.g., >50%). Supplemental funding above the per-student base level is provided for students with the most severe or complex needs, such as autism, ventilator dependency, or severe behaviour problems.	Qualitative analysis was used to determine the extent to which categorical funding adhered to the principles of diversification, contestability, quality control, and accountability. The analysis focused on 1995 Governmental reforms in the Ontario, Canada educational system, with specific emphasis on analysing the implications of these reforms for SEN students. Comparative analyses were made to economic-based models in England, Wales, New Zealand, and the USA. The purpose of this qualitative analysis was to document the types of difficulties in other countries that could then be anticipated in the Ontario reforms.	Funds primarily allocated for teaching assistants. This approach seems to provide less incentive to include SEN students. SEN students exempted from high-stakes assessment. Funding model may curtail accountability to parents and create legal challenges in relation to quality control and accountability. With the move to standards-based and market-based reforms, the model may lead to inequities for SEN students, increased litigation, and increased social, professional, and personal costs.

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Study	Category/Name of funding model	Methods	Findings/conclusion
Category of funding model: Categorically-based			
Piji & Dyson (1998)	Pupil-Bound Budget: Funds are allocated to individual students depending on the child's assessed level of SEN. The funds are used to buy the school's services. The allocated budget follows the child if parents decide to change schools.	Structured interviews with various informants in Austria, England, and Germany. Recruitment of informants was made through contacts with the major educational authority in each country, although details were not provided on exactly who was interviewed in each country (i.e., Education Minister, School Principals). A list of questions was developed that included items related to funding systems, budget allocation for SEN, types of SEN services, and integration policies.	Pupil-bound budgets strengthen parent choice. A greater percentage of the budget can be allocated to direct services. The model is unlikely to promote inclusion or reduce the number of students in special education.
Category of funding model: Voucher programs			
Etscheidt (2005)	Publicly-Funded Voucher Plan: This voucher program consisted of a government payment of a certain set amount to fund the child's education. The value of the voucher, which typically ranged from \$US4500 to \$US21,000, was based on actual educational or tuition costs, whichever was less. The payment was made either directly to the parents, who then sought out a school, or directly to the chosen school on behalf of the parents.	The authors conducted a multidimensional qualitative analysis to identify the possible impact of the voucher program on educational programs for students with SEN. The analysis considered the possible legal, economic, academic, sociological, and political dimensions.	Analysis suggested that vouchers might negate some SEN entitlements. Competition stimulated by vouchers may improve outcomes and reduce costs, but competition may not affect schools to the same degree and the effects may be subtle and modest. Cost-effectiveness of this model is unclear as are the effects on academic achievement. Vouchers associated with more specialised schools for SEN students, but impact on inclusion more generally, and on quality of services, is unknown.

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TABLE 1 (CONTINUED)

Summary of the Funding Model(s), Methods, and Major Findings/Conclusions for Each Study by Category

Study	Category/Name of funding model	Methods	Findings/conclusion
Category of funding model: Voucher program			
Granell (2002)	<p>Cheque Escolar: This Spanish voucher program was used to fund nursery (preschool) education. Parents applied for a voucher, which was then assessed by Education Office. Applicants who were deemed eligible to receive a voucher were granted amounts that varied on a sliding scale depending on parent and child characteristics (e.g., income, child's needs). Vouchers could be applied towards paying the costs of education services at the parent's chosen school.</p>	<p>The study involved a review of an existing database and questionnaires completed by parents. The database, held by Education Service of the City Council of Valencia, Spain, included information on all voucher applicants (e.g., place of residence, size of family, family income, child's disabilities). The parents surveyed had children in nursery schools in Valencia, where the voucher program was centered. The survey was conducted in a representative, stratified sample of schools with parents invited to participate by filling out a questionnaire. The questionnaire focused on the costs of the voucher program and impact of parent choice during its first 7 years of implementation. From a theoretical population of 4,191, surveys from 1,994 (47%) parents were obtained.</p>	<p>Voucher amounts varied from \$ESP26 to \$ESP87/month. Voucher recipients had lower incomes than nonrecipients. Fifteen percent of parents overall (but 32.6% of parents with children under 3) reported that they would not have sent their child to nursery schools without the voucher incentive. Overall rates for nursery school attendance increased from 61.9% to 64%. 87.9% of the voucher recipients were able to enroll their child in the preferred school. 4.6% would have chosen another school if the voucher amount had been higher. 67.7% of parents would have chosen the same school in the absence of vouchers. Recipients held more favorable opinions of vouchers than nonrecipients.</p>
Category of funding model: Census-based funding			
Evans et al. (1997)	<p>Age-Weighted Pupil Unit (AWPU): Funding is based on the number of students and weighted by age or by other pupil-led variables, such as including a poverty adjustment for students from economically disadvantaged areas.</p>	<p>Questionnaires/interviews with school personnel across five local education authorities (LEAs) in the UK. Protocols canvassed issues related to SEN funding, including items asking about resources and disincentives for accommodating students with SEN. Questionnaires were sent to SEN coordinators in all primary and secondary</p>	<p>Percentage of the general school budget allocated to SEN ranged from 10.3 to 17.2%. Funding should be weighted to favor schools with more SEN students and focused on prevention based on a prior risk assessment.</p>

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Study	Category/Name of funding model	Methods	Findings/conclusion
Evans et al. (1997) (continued)	Category of funding model: Census-based funding	schools across the five LEAs with a response rate of 70% yielding 473 returns. Interviews were conducted with a smaller sample of SEN administrative personnel and teachers, but details on this sample and interview protocol used were lacking. Additional information about SEN policies, management practices, and funding for professional development, was gathered from documents supplied by each LEA.	Funding for SEN increased at an annual rate of 7.8%, which, while higher than the increase for general education, was lower than the average annual increases observed prior to introducing the new census-based funding model. SEN did not take a larger share of the total education budget, but local share increased from 44 to 51%. Number of SEN personnel increased by 12%. SEN students increased by 8% (mild) and 25% (severe). These increases were 2 x and 6 x the increase in total enrollment, respectively. Standard amounts per student (\$US1200) rather than percentage (i.e., 15%) need adjustment. Census-based funding increased the cost-share burden for local districts, but did not lower expenditure or decrease SEN enrollments.
Hartman (2001)	Census-based Special Education Funding Model: Funding is based on a percentage of total enrollment. For students with mild disabilities, districts received \$US1200 x 15% of the district's total enrollment. For students with severe disabilities each district received \$US12,000 x 1% of total enrollment.	The impact of a new census-based funding model was evaluated after 5 years of full implementation in Pennsylvania. Trends were analysed by reviewing data that was available at the state level about the census-based reform. Descriptive information was provided on special education funding, revenues, staff, and enrollment. Trends in these areas were analysed by reviewing state budgetary, enrollment, and expenditure data.	Funding for SEN increased at an annual rate of 7.8%, which, while higher than the increase for general education, was lower than the average annual increases observed prior to introducing the new census-based funding model. SEN did not take a larger share of the total education budget, but local share increased from 44 to 51%. Number of SEN personnel increased by 12%. SEN students increased by 8% (mild) and 25% (severe). These increases were 2 x and 6 x the increase in total enrollment, respectively. Standard amounts per student (\$US1200) rather than percentage (i.e., 15%) need adjustment. Census-based funding increased the cost-share burden for local districts, but did not lower expenditure or decrease SEN enrollments.

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Study	Category/Name of funding model	Methods	Findings/conclusion
Paquette & Smith (2001)	<p>Category of funding model: Cost-based approach</p> <p>Cost-based Approach: This model sought to ascertain the actual costs of providing special education to students in various disability categories (e.g., mild disabilities vs. multiple disabilities). Funds to cover these estimated costs are then allocated on the basis of the number and types of students enrolled.</p>	<p>Simulation analyses of the costs for mild and severe disability categories were run to compare differences when funds were allocated using census-based, category-based, or flat rate funding formulas. Estimated expenditures on special education programs from seven First Nations communities in Canada were analysed. Cost data related to type of personnel (e.g., teacher, teacher aide) and program (e.g., regular classroom, special classroom, withdrawal program) were obtained for use in the simulation analysis. Teachers provided reports on time spent for each service as a way of estimating costs. These figures were then compiled to estimate costs of providing services to SEN students.</p>	<p>Estimates of per-pupil costs for special education varied from \$CAD3170 for students with mild LD to \$CAD16,777 for students with multiple disabilities. These figures suggest that the cost of special education is not unusually high. With cost-based approach, funding levels are based on empirical data of actual costs.</p>

model investigated by Grigal et al. (2001), for example, schools could allocate 20% of their budget to special education. Similarly, in the Student-Focused funding model described by Naylor, additional funding was set aside specifically for students who required specialised services and intensive support due to the severe nature of their developmental, sensory, and/or physical disabilities. In its focus on students with high support needs, Naylor's model included elements of more categorically-based approaches. Furney et al. investigated a third variation on the discretionary model, which involved the redistribution of money from advantaged to disadvantaged areas. Disadvantaged schools received additional discretionary funding with the aim being to equalise access to high quality educational services for students in these schools. In all of these studies, it appears that individual schools had considerable discretion as to the types of services and programs that could be funded with their additional or separate discretionary funds, provided of course that these expenditures were consistent with broad guidelines. These discretionary funding models aimed at fostering innovation in special education programming.

Categorical funding. Two studies (Jordan, 2001; Pijl & Dyson, 1998) examined the use of Categorical funding models. These models involved a set amount of additional funding for each student with an identified disability. In both studies, the amount of extra funding was based on the child's degree and type of disability. In the model described by Jordan, this extra funding went to the school, whereas in Pijl and Dyson's study, it was the parents, rather than the school, who received the extra funding. Parents could take this extra funding with them should they decide to change schools. In this respect, the categorical model described by Pijl and Dyson included features of the two voucher programs described later. In both studies, the funding formula aimed at ensuring that special education funds were specifically targeted to meet the needs of children with identified disabilities.

Voucher programs. In addition to the variation described by Pijl and Dyson (1998), two additional studies (Etscheidt, 2005; Granell, 2002) analysed the use of voucher programs for funding specialist educational services. The voucher programs in both of these studies involved a direct public payment to parents to cover their child's public or private school costs. The amount of the voucher varied depending on parent and child characteristics, such as the type and degree of the child's disability and parent income. In the program described by Etscheidt, the payment was made either directly to the parents or to a school on behalf of the parents. The aim of this program was to increase parent choice and thereby hopefully improve the quality of education by promoting competition between schools. In the program described by Granell, parents received monthly vouchers for paying their child's preschool tuition, with the aim being to increase preschool participation among economically disadvantaged children.

Census-based funding. Two studies investigated census-based models for funding special education (Evans et al., 1997; Hartman, 2001). In both studies, the funding received by a school district or local education authority was based on the number of students and weighted by pupil-led variables, such as socioeconomic status or type and degree of disability. In Hartman, for example, schools received a set amount of funding based on total enrollment. This per pupil amount was a set figure that was designed to cover special education for the 15% of students who were estimated to have mild disabilities. A larger amount was provided for 1% of the school's total student population to cover special education costs for students who would be expected to have severe disabilities.

The aims of census-based approaches are to simplify the overall funding mechanism and to make the financing of special education independent of classification and placement decisions. By doing so, census-based funding models are intended to remove the financial incentives for overidentifying students as disabled, which are presumed to operate in more categorically-based funding models.

Cost-based approach. One study (Paquette & Smith, 2001) investigated a model of allocating funds that was based on first estimating the actual costs of providing special education services. More specifically, Paquette and Smith estimated the costs of providing services to students with mild disabilities and, separately, for students with multiple disabilities. Funds to cover these estimated costs could then be allocated to schools on the basis of the number of students meeting the definition for mild or more severe/multiple disabilities. This model is unique in attempting to estimate the actual costs of providing services, but it also includes features of categorical and census-based approaches in that the total amount of the special education funding is based on the number of students with mild and severe disabilities. The model aims to provide an empirical basis for the allocation of special education funding.

Evaluation of the Studies' Methodologies

Seven of the 10 studies employed one of three general methodological approaches to investigate the impact, implications, or outcome of special education funding models: (a) interview/survey, (b) descriptive/statistical analyses of existing data sources, or (c) qualitative analyses of funding models. The three other studies used a combination of approaches. Two of these latter studies (Evans et al., 1997; Granell, 2002), used a combination of interview/survey and descriptive/statistical analyses of existing data sources. The other study (Furney et al., 2005), combined descriptive/statistical analyses with interviews and direct observations in 65 schools, although the details concerning what was observed and how the observations were conducted were lacking from the report.

In the six studies that used interview/survey methodology, the informants were school principals and special education coordinators (Evans et al., 1997; Furney et al., 2005; Pijl & Dyson, 1998), teachers (Grigal et al., 2001; Paquette & Smith, 2001), or parents (Granell, 2002). The exact interview/survey items were not clearly specified in all of the studies, but in five of the six cases the interview/survey protocol was said to include at least some items related to funding. Similarly, many of the studies failed to provide details on the exact number of informants and their demographic characteristics (e.g., age, years of experience, etc.), but it appeared that sample sizes ranged from three (Pijl & Dyson, 1998) to over 65 informants (Furney et al., 2005). In five of the studies that included interview/survey methodology, the protocol items related to funding were primarily aimed at documenting the perceptions of the informants with respect to the impact of the funding model on (a) SEN students access to services, and (b) the quality of the services. The exception is Paquette and Smith. Their protocol asked staff to record how much time they spent in activities related to students with SEN. These reports were then used in a simulation analysis to estimate the costs associated with the provision of SEN services.

Five studies included descriptive/statistical analyses of existing data sources (Evans et al., 1997; Furney et al., 2005; Granell, 2002; Hartman, 2001; Naylor, 2001). In four of these studies (Evans et al., 1997; Furney et al., 2005; Hartman, 2001; Naylor, 2001), the researchers accessed local-, state- or provincial-level data related to special education

services, entitlements, and funding. Furney et al. (2005) provided few details about their search of the existing [Education Department] database. Evans et al. (1997) noted that, in addition to interviews, information was collected about SEN policies from documents supplied by each LEA. In two studies (i.e., Hartman, 2001; Naylor, 2001), the researchers extracted descriptive information about budget allocations and enrollments from state- and provincial-level databases, respectively. In both of these 2001 studies, the approach taken by the researchers enabled them to analyse trends related to the cost and demand for special education. Granell analysed completed application forms to extract demographic information (e.g., place of residence, size of family, family income, child's disability) on the families who had applied for a voucher. The purpose of this analysis was to determine whether the voucher program was reaching its intended audience of disadvantaged families.

Two studies (Etscheidt, 2005; Jordan, 2001) conducted qualitative analyses in an effort to better understand the possible impact of recent special education funding reforms. Etscheidt (2005) analysed the legal, economic, academic, sociological and political dimensions of a voucher program in Florida that targeted students with identified disabilities. Etscheidt's process involved systematic analysis and critique of archival sources (e.g., Court decisions, economic theories, efficacy data). The intent of this multidimensional qualitative analysis was to develop a framework for evaluating the potential impact of voucher-based funding reforms in special education. Jordan used a similar qualitative process to analyse the extent to which a category-based funding reform in Ontario Canada, produced outcomes that were consistent with principles of diversification, contestability, quality control and accountability. Each of these principles was considered fundamental to ensuring that: (a) there was equitable access to special education services, (b) that these services were educationally appropriate, and (c) that the use of fiscal resources was appropriate and economically sound. A unique aspect of Jordan's study was her attempt to make comparisons with other market-based reforms to special education that had occurred in England, Wales, New Zealand, and the United States. These comparisons were intended to identify the difficulties that might occur when reforms of this type are undertaken.

Evaluation of the Studies' Results and Conclusions

Discretionary funding models were associated with an increased capacity to provide SEN services, but only for schools that received extra funding (Furney et al., 2005; Grigal et al., 2001). Grigal et al. (2001) reported that discretionary funding was associated with the development of innovative, age-appropriate programs, whereas Furney et al. (2005) found increased use of alternative placements and a narrowing of curriculum offerings, especially among schools that received less [discretionary] funding. Naylor's (2001) analyses suggested that the student-focused approach involving discretionary funding did not significantly increase the percentage of students identified as having high support needs, but there were substantial administrative costs associated with the identification process.

Jordan (2001) found that the category-based funding reforms initiated in Ontario, Canada resulted in SEN funds being used primarily to hire teaching assistants. From her analysis, she concluded that the reforms might curtail accountability to parents and create inequities for students with SEN. Both of these potential problems could increase litigation related to special education entitlements. In contrast, Pijl and Dyson (1998) found strengthened parent choice and increased expenditure on direct services, although they concluded that this model was unlikely to promote inclusion or reduce

the number of students identified as requiring special education. It is also important to note that, unlike the categorically-based model studied by Jordan, the pupil-bound budgets of Pijl and Dyson included features of both categorically-based models and voucher programs.

Voucher programs, while having the potential to negate some SEN entitlements according to Etscheidt's (2005) analysis, were also seen to be associated with increased access to preferred and more specialised services (Granell, 2002). The effects of voucher programs on educational outcomes and cost-effectiveness, while potentially positive, remained unclear and would likely vary across schools. The influence of varying the amount of the voucher also remains unclear.

Census-based funding models were associated with varying (Evans et al., 1997) and increasing SEN costs (Hartman, 2001). SEN costs absorbed from 10.3% to 17.2% of the school budget and increased at an annual rate of 7.8%. However, this increase, while higher than that observed for general education costs, was lower than the increase observed prior to the introduction of the census-based funding model. Overall, census-based funding did not appear to lower costs or reduce SEN enrollments. Evans et al. (1997) concluded that census-based models could be improved by weighting formulae to compensate schools with higher SEN enrollments and allow funding of prevention programs.

Paquette and Smith (2001) estimated that the cost of educating students with mild versus more severe/multiple disabilities was \$CAD3170 and \$CAD16,777, respectively. These estimations suggested that the special education costs were not unusually high and might be contained by first estimating the actual per-pupil costs.

Discussion

While the literature includes numerous descriptions of special education funding reforms (Hartman, 1992; Parrish & Chambers, 1996; Presland, 1996), our search identified only 10 contemporary studies on the impact of such reforms. Apparently there have been relatively few attempts to systematically evaluate the impact of recent special education funding reforms. This is surprising given the fact that special education funding reform has been on the agenda in several countries for at least the past 10 years (Jordan, 2001; Hartman, 2001; Pijl & Dyson, 1998; Parrish, 2000). Of course, the inclusion of older studies (e.g., Richards & White, 1989) and 'grey' literature might have increased the pool of studies, but this approach was inconsistent with our aim, which was to inform and advance evidence-based practice by reviewing contemporary research and ensuring quality control via the peer-review process (Muir, 1999). While it is inevitable that some studies were omitted, our search procedures and inclusion criteria were intended to identify the most visible and best of the contemporary literature. It is these studies that represent the current evidence base and thus it is these studies that we hope would have the most impact on researchers and policy makers. Our systematic review of these 10 studies, while perhaps moderate in scope, reflects the current literature and thus has value in guiding future research and informing policy debates.

The results of our review highlight variety in this literature. The 10 studies we identified and reviewed investigated a variety of funding models, using a variety of methodologies. This variety suggests considerable innovation in policy related to special education funding. Unfortunately, this variety makes it difficult to compare and contrast outcomes across studies or draw any firm conclusions about the relative impact of the

various funding reforms investigated. Our review therefore attempted to bring some order to this variety by including a systematic analysis and classification of each study in terms of the funding model(s) investigated, the methodologies used and the resulting impact of these reforms. As it transpired, the 10 studies included in our review are drawn from a number of different countries. Thus, the unique national demographics, cultural differences, histories and current political realities may well impact the validity of our analyses in as yet unexplored ways.

In terms of funding models investigated, we classified these into five broad categories: (a) Discretionary, (b) Categorically-Based, (c) Vouchers, (d) Census-Based, and (e) a Cost-Based approach. The resulting coding of studies into these categories appeared reliable in the sense that there was adequate interrater agreement between the two independent raters. The validity of the system, however, remains to be determined.

There is some reason to worry about validity when classifying funding models because identical funding models are often named differently. Hartman (2001), for example, investigated a clear example of census-based funding and he called it census-based funding. Evans et al. (1997), in contrast, referred to an equally clear example of census-based funding as the Age-Weighted Pupil Unit. Similarly, the three discretionary-based approaches (Furney et al., 2005; Grigal et al., 2001; Naylor, 2001) each went by a different name. This variety of terminology makes it difficult to compare and contrast funding approaches. A classification system, such as the one we used in our review, may therefore assist reviewers and policy makers in bringing some order to the inconsistent nomenclature in the field.

Another validity issue is that, within these broad categories, many of the named funding models included elements of more than one approach. For example, the Pupil-Bound Budget described by Pijl and Dyson (1998) provided a set amount of funding depending on the nature and severity of the child's disability. In this respect, the allocation of funds was categorically-based. However, funding was distributed to parents, who could then choose which school to send their child to. In this respect the approach investigated by Pijl and Dyson included elements of the voucher programs described by Etscheidt (2005) and Granell (2002).

These points about validity raise the issue of how best to classify and conceptualise the various funding models that have been described in the literature. We decided on an operational approach based on: (a) where the funds came from, (b) how the funds were allocated (e.g., based on child's disability, based on estimated costs), and (c) to whom the funds were distributed (e.g., schools, programs, parents).

Our five broad funding categories might be usefully conceptualised in terms of a continuum, with census-based models at one end and categorically-based models at the other. In a purely census-based approach, schools receive funds based only on the number of students, whereas in a purely categorical approach, the size of the special education budget depends on the number of students identified as having this or that type of disability. Many of the funding models described in this review would best be placed between these two ends of a continuum, in that funds were allocated based on the population, but the amount of funding per pupil was influenced by various demographic and constitutional variables, such as the family's socioeconomic status or the child's type of disability. Orthogonal to this continuum might be an axis with anchors related to whether the funds go to the district, school, program, or parents. That is, another continuum may be evident that ranges from central control of funds to parental control of funds. Most of the funding models described in this set of 10 studies could be

placed somewhere along each of these proposed two continua, with the possible exception being the cost-based approach described by Paquette and Smith (2001).

Our experience in conducting this review suggests that there may be value in moving towards continuum-based conceptualisations of special education funding models with two axes: (a) Census-based to Categorically-Based funding, and (b) District-Controlled to Parent-Controlled funding. The point at which any particular approach is located on the continuum might be initially based on the best available evidence, but then adjusted as new data accumulate to ensure the anticipated outcomes accrue. The ability to make such adjustments would depend on having sufficiently fine-grained evaluative procedures in place to monitor the impact of the funding reform on an ongoing basis. That is, there is a need for formative, rather than only summative, evaluation.

None of the 10 studies involved direct evaluation of the impact of funding reforms. Instead, these studies relied on three types of methodologies that provided (at best) an indirect and generally posthoc evaluation of the perceived impact of funding reforms. Specifically, the methodologies used included: (a) interview/survey, (b) descriptive/statistical analyses of existing data sources, or (c) qualitative analyses of funding models. These approaches may have provided useful information regarding stakeholder perceptions about funding reforms and enrollment trends, for example. But these type of data are somewhat limited for evaluating the actual impact of funding reform on student outcomes. Thus, there would seem to be a clear need for additional studies that attempt to more directly assess the impact of special education funding reforms on the academic achievement of students and the quality of the education provided.

We found considerable variety in the results reported in these 10 studies. Generally, none of the five funding models appeared to be associated with any major increase in either the costs of special education or the number of children identified as having SEN. However, there did not seem to be any consistent outcomes associated with one model or type of reform over another. This could reflect the fact that the studies used different methodologies and examined different outcome variables. Therefore, results reported and conclusions reached by the authors, as summarised in Table 1, should be interpreted with caution, given the differing circumstances, varying methodologies, and limited range of outcome variables.

Much has been written on the presumed impact of various types of funding models (Hartman, 1992; Parrish, 2000). An assumption in the literature appears to be that funding formulae and models influence the programs and practices provided to individual students at the local school level. Differing funding models seem to create incentives and disincentives for certain types of practices. Categorical funding models, for example, would seem to provide an incentive to identify more students as having a disability. While our review found no empirical evidence to support such a claim, this could reflect the limited scope, methodology, and the impact and outcome variables that were studied. Recent increases in the prevalence of autism in Australia, the United States, United Kingdom, Canada, Japan and China are well documented (Baker & Stokes, 2007; Chakrabarti, & Fombonne, 2001; Rutter, 2005; Wong, & Hui, 2008). Skellern, Schluter, and McDowell (2005), in an anonymous survey of child psychiatrists and paediatricians involved in the diagnosis of autism in Queensland, concluded that much of the rising incidence rates are the result of psychiatrists and paediatricians 'upgrading symptoms to reach diagnostic thresholds in order to secure funding for individual children in response to external funding pressures' (p. 408).

Parrish (2000) argued that 'there is no such thing as an incentive-free [funding] formula ...' (p. 441). It is, therefore, possible that a categorically-based funding model

might in fact lead to more children being identified as disabled. Here, of course, the diagnostic process is meant to serve as a check and balance. As noted by Naylor (2001), however, the costs of verifying a child's diagnosis are considerable. Indeed, Reynolds, Wang, and Walberg (1987) estimated that up to 20% of the costs associated with educating a child with SEN is taken up by the identification process. This estimate suggests that 20% more money would be available for special education programming by simply moving the funding formula along the continuum from a category-based approach to a more census-based model.

If, in fact, it is true that all funding schemes create incentives and disincentives, then eliminating counter-productive incentives might require the deliberate decoupling of funding formula and educational programs. This is a potential advantage of voucher programs. In a voucher program, parents receive a set amount of funding to cover the cost of their child's education. This amount might be based on the actual costs of educating the child using Paquette and Smith's (2001) simulation model. Parents would then decide how best to use these funds for their child's education. In this way, market forces would presumably shape program development. The programs would be accountable to parents, who could choose to move their child, and the associated funds, if the program was not satisfactory.

The results of this review provide some support for this combination of a cost-based formula and voucher program. The study by Paquette and Smith (2001) showed that the actual costs of providing special education services to children with mild and severe/multiple disabilities can be estimated fairly accurately. Meanwhile, the results of the two studies on voucher programs (Etscheidt, 2005; Granell, 2002) suggest that such programs increase parent choice and satisfaction and also increase access to specialised (and presumably more effective) educational services. Evidence from earlier experiments with voucher programs further suggests that these efficiencies are indeed likely benefits (Richards & White, 1989).

A fundamental question raised by the results of this review is whether effective special education services require special funding arrangements and expensive policy reform initiatives. Perhaps a purely census-based model — that appears to be the most straightforward and least costly to administer — would be no worse or no better than some more elaborate alternative. While data suggest that special education costs more than regular education, the related assumption is that it has to cost more (cf. Paquette & Smith, 2001) and that it has to have a complex funding model to support it. However, these assumptions might not be valid. From our review, we could find no evidence that any of these funding reforms were associated with any better (or any worse) outcomes in terms of educational achievement for children with SEN. There may be some meaningful and causal associations between outcome and funding reform, but studies demonstrating any such associations were not located.

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