Curriculum Studies based on the ICM

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While many professionals in the field of gifted education have rightly continued to focus on the identification practices used to identify the gifted student from poverty (Lakin, 2016; Lakin & Lohman, 2013; Warne et al, 2013; VanTassel-Baska, Johnson, & Avery, 2002) and the policies that influence the use of different identification tools (McClain & Pfeiffer, 2012; Brown, VanTassel-Baska, Worley, & Stambaugh, 2006; Robinson, Weinberg, Redden, Ramey, & Ramey, 1998), there has also been extensive work done on programs and curricula designed for this population as well. Reports from the federally funded Javits program, that has focused predominantly on this population over the past 28 years, all suggest that attention to differentiated curricula has been crucial to success in working with gifted learners from low income backgrounds (Adams & Chandler, 2014; Swanson, 2016).

The Javits Projects since 1989 have been focused on promising students of low income and twice exceptionality as the target populations of interest, leading researchers to concentrate their energies on finding effective interventions for these populations as well as models of family involvement and professional development of teachers that work. Efforts have also included an emphasis on locating alternative tools to identification. Yet this paper's focus is on the curriculum interventions that have been found successful with these students, and the basic design model that has produced units that work.

Beginning in 1990, there was a call to design new curricula, modelled on the recently released new curriculum standards, that might elevate the learning of students from poverty. These one year contractual projects, funded through the Javits program at USDOE, were awarded to William and Mary and, called The National Science and Language Arts Projects for High Ability Learners, also provided a new model for designing curriculum, based on the content expertise of professionals in the sciences and language arts merged with the expertise of educators of the gifted. These early curriculum projects laid the groundwork for later curriculum efforts in all subject areas that provided key materials for gifted students to access in gifted programs.

Although designed with an eye to students from poverty, the curriculum also was found to be successful with all groups of gifted learners (VanTassel-Baska, Bass, Reis, Poland &Avery, 1998; VanTassel-Baska, Zuo, & Little, 2000). This first generation of curriculum used The Integrated Curriculum Model, developed by VanTassel-Baska, 1986, to organize the differentiation features of the materials while the national standards guided other features. Used in over 100 school districts in the first years of dissemination, districts began collecting data on its effectiveness over time with gifted students, especially its success with low income learners (Feng, VanTassel-Baska, Avery & Little, 1996), demonstrating growth over years in critical thinking and scientific reasoning. Other successful projects during this period focused more on the instructional intervention employed rather than curriculum elements per se (eg. Sternberg Ferrari, Clinkenbeard & Grigenko, 1996).

The second generation of Javits grants (2000-2005) focused on the need to provide comprehensive opportunities to students, teachers, and parents, and the emphasis on curriculum was subsumed as a part of the studies, not the central feature. The population focus remained the same, and the research model involved school districts as well as universities in the process of exploring interventions that worked. In this second iteration of Javits proposals, the need to provide more longitudinal research across at least three years was required along with an emphasis on larger populations of eligible students and a tighter research design. Most settings for these projects were Title I schools. The funding cycle changed as well from 18 months in the case of the first curriculum-based projects to five years as the duration within which the projects might be planned, implemented, and studied. In this iteration of projects, several emerged as highly successful in the specific areas of language arts (VanTassel-Baska, Bracken, Feng, Brown & Stambaugh, 2010, French, 2006; Stambaugh, 2007; VanTassel-Baska & Stambaugh, 2008); science (Kim, VanTassel-Baska, Bracken, Feng, Stambaugh, & Bland, 2010; Kim,VanTassel-Baska,Bracken,Feng, & Stambaugh, 2014), social studies (Little, Feng, Rogers, & Avery2007); and math (Gavin, Casa, Adelson, Carroll, & Sheffield 2009). With the exception of the math project, all used the Integrated Curriculum Model (ICM) as the basis for their design.

The third generation of Javits grants (2006-current) has continued to focus on students of poverty and twice exceptionality and have included curriculum interventions as a part of project goals. With this generation of projects, however, there were several examples of the use of the earlier curriculum designed as replication with project students rather than designing new material (Swanson, 2008; Cotabish , Dailey, Hughes & Robinson, 2014). For example, Swanson used the language arts and science curriculum, designed by the team from William and Mary, in her project while Cotabish, Dailey, Hughes & Robinson used the Project Clarion science units as the project intervention. The Young Scholars program, adopted by several districts to find young low income and minority students also used the ICM-based curriculum in all content areas as part of an intervention menu (Horn, 2014). Other Javits-funded projects from this period produced results using targeted pedagogical approaches to reading that enhanced fluency and comprehension for Title I students (Reis, Eckert, McCoach, Jacobs, & Coyne, 2008; Reis, McCoach, Little, Muller, & Kaniskian, 2011). More recent Javits-funded curricular interventions have focused on enhanced learning skills, using an alternative integrated model of curriculum.

Table I provides an overview of the ICM-based curricula that have proven to be successful longitudinally and/or in replication in addressing the educational attainment to higher levels for gifted learners and students from poverty. Most of these projects have been Javits-funded over the past 25 years; others have received sustained funding from private foundations in addition to Javits support. Researchers focused their questions on the value of particularized intervention services to low income learners as well as on related issues like teacher growth in the use of differentiation and other professional development opportunities, support structures necessary for successful innovative interventions in schools, and school change as a result of the intervention project itself. Yet it is the effects of these interventions on students that is the central focus of the projects reported in Table I.

Table I: The Integrated Curriculum Model (ICM)-Based Curriculum Projects

Project Title	Curriculum Base	Grade Levels	Goals and outcomes	Research evidence of effectiveness
Project Clarion	Science	K-3 levels	-Science topics -Scientific reasoning -The concept of systems	-Kim, VanTassel-Baska, Bracken, Feng, Stambaugh, & Bland, 2010 -Kim, VanTassel-Baska, Bracken, Feng, & Stambaugh, 2014
Project Athena	Language Arts	Grades 3-5	-Literary Analysis, -Persuasive writing, and -Critical thinking.	-VanTassel-Baska, Bracken, Feng, & Brown, 2009
Jacob's Ladder	English/Language Arts	Grades PK-8 grade levels	-Reading comprehension -Critical thinking -Social-emotional development	-French, 2005 -Stambaugh, 2007 -VanTassel-Baska, J. & Stambaugh, T. (2006)
National Science Curriculum for High Ability Students Project	Science (Problem-based learning units)	Grades 2-8	Advanced science content Scientific processes Understanding the concept of systems	-VanTassel-Baska, Bass, Ries, Avery & Poland, 1998 -Feng, VanTassel-Baska, Quek & Bai, 2005
National Language Arts Curriculum for High Ability Students Project	Language Arts	Grades 2-12	Understanding the concept of change Literary analysis Persuasive writing	-VanTassel-Baska, Zuo, Little & Avery, 2002 - VanTassel-Baska, Johnson, Hughes, & Boyce, 1996 -Feng, VanTassel-Baska, Quek & Bai, 2005
Project Phoenix	Social Studies (history)	Grades 6-8	Concept development Critical thinking Historical understanding	-Little, Feng, Rogers, VanTassel-Baska, & Avery, 2007