

LMS[™]

PowerZone White Paper

***Research Basis for PowerZone
Proven-Effective Features &
Implementation Strategies***

By Karlyn Kamm, M. S.

December, 2003

CONTENTS

Summary of Related Research	4
PowerZone Instructional-Based Features	4
Context.....	4
Format.....	4
Accountability & Management	5
Content	5
Communication with InterConnect.....	5
PowerZone Summary of Related Research Findings for Proven- Effective Implementation Strategies	6
Motivation.....	6
Instructional Games in the Classroom.....	7
Cooperative Learning in the Classroom	7
Peer Tutoring	9
Appendix	10,11

SUMMARY OF RELATED RESEARCH

As administrators become increasingly involved with student accountability to meet educational standards and directives in the recent No Child Left Behind Act, it has become imperative to focus on programs that are well grounded in sound educational principles. Programs that can deliver solid results become an important ingredient in the process of improving student experiences, learning, and test results.

PowerZone software is designed to enrich and support student mastery of academic content in classrooms at upper elementary through high school levels. The concepts, content, format, accountability, and communication aspects of PowerZone are based on educational principles that have been evaluated over the past several decades in a large number of studies in many different disciplines.

To help administrators better understand the instructional nature and purpose and the research basis of PowerZone, the salient features are identified and relevant research findings are briefly summarized.

POWERZONE INSTRUCTIONAL-BASED FEATURES

Context

- Supports a gaming (quiz bowl) structure that promotes cooperative learning and interacting and team-spirited competition
- Provides a motivational framework throughout a course of instruction
- Uses the latest multimedia technology (music, voice-overs, special effects, animation and video) to engage students interactively
- Target students ages and grades appropriately with tone, content and graphics

Format

- Encompasses four components of self-motivation: attention, relevance, confidence, and satisfaction
- Empowers students to be active in their own learning
- Encourages students to acquire new information in order to improve their game performance
- Supports cooperative learning, peer tutoring, and all-student participation
- Engages students with a multi-sensory approach
- Promotes class discussion through questions and content topics
- Focuses on preparation and performance as students create written summaries and notes for use during game sessions

Accountability and Management

- Provides record-keeping, allowing teachers to focus on content; the computer tracks student input and questions answered correctly and incorrectly
- Is available on cross-platform CDs and is easy to use by teachers and students
- Is flexible and adaptable to student needs, levels, and classroom settings
- May be used as a basis for topic preview or review
- Provides the PowerZone Toolkit so teachers can enhance topic content by adding specific source material and/or questions pertinent to class study

Content

- Encourages development of cognitive and language abilities, lively discussions, and enthusiastic information-seeking in a wide range of academic subjects
- Is correlated to national standards and leading textbooks
- Is professionally developed according to standard test construction guidelines: students must know the material to answer correctly; guessing right is minimized
- Covers important points and concepts and avoids focusing on trivial information
- Provides immediate and instructional feedback (students get clues about why an answer is incorrect and a rationale for why a response is correct)
- Bonus Questions can be added that focus on additional concepts, require more interpretative and analytical skills, or serve as discussion starters for topics specific to student needs

Communication with InterConnect

- Allows students to participate and work with peers outside their classroom
- Encourages collaboration, teamwork, and social interactions
- Provides opportunities for “getting to know” peers from other places to improve communication with unfamiliar groups and to appreciate cultural differences

POWERZONE SUMMARY OF RELATED RESEARCH FINDINGS FOR PROVEN-EFFECTIVE IMPLEMENTATION STRATEGIES

Relevant studies supporting the concepts embodied in PowerZone are organized into several basic learning-strategy topics: motivation, instructional games, cooperative and competitive interacting/learning, and peer tutoring.

Following each topic are two brief statement categories: the first summarizes sample research findings relevant to a PowerZone strategy, and the second highlights particular PowerZone features and how they relate to PowerZone implementation in the classroom. The studies are cited in Appendix A and are referenced in the ERIC Clearinghouse with an ED (ERIC digest) or EJ (ERIC journal) designation; all reports and many additional references can be found on the AskEric (www.askeric.org) website.

Strategy: Motivation

Summary of Sample Research Studies:

- Motivation is important in learning and increases it; students who are motivated do better.
- There are two essential forms of motivation: intrinsic and extrinsic. It's an important goal for educators to develop intrinsic motivation, at least by the junior high level.
- Motivation is measured on reliable scales.
- Motivation orientation can be changed (increased) through several factors, such as a positive atmosphere and feedback (reinforcement), engagement, cooperative learning, and setting and accomplishing goals.
- Rewards can be overused and reduce interest, so teacher judgment in using them is critical.
- Girls and boys are typically motivated differently; good motivation is also tied to a good GPA.

Relevant PowerZone features:

The PowerZone game, itself, is intrinsically motivating and engaging. The format fosters cooperative and competitive learning, creates a positive atmosphere, and impacts students' mastery of academic content through carefully crafted questions (covering both facts and concepts) and intermittent discussions. PowerZone is targeted for age levels where increasing motivation is highly important; it appeals to both boys and girls.

Relevant Research Studies: Refer to Appendix A

Strategy: Instructional Games in the Classroom

Summary of sample research studies:

- An instructional game is in a learning format, offers competition, and is rule-guided.
- Instructional games provide a motivating practice alternative to traditional activities.
- Games should be intrinsically rewarding—where the game itself helps to teach the instructional content and provide motivational structure.
- Technology-based instructional gaming has a wide spectrum of utility for learning; games promote higher-level intellectual skills and attitudes.
- Games serve many functions: tutoring, amusement, promotion of self-esteem, desire to change an attitude, exploration of new skills, and practice and drilling of existing skills.
- A popular format is to introduce an activity and then use a game to engage the learner in teacher-guided, competitive interaction.
- A fantasy context allows the learner to make errors with minimum detriment; game endings should be satisfactory for both winning and losing learners.
- Gaming is equally effective in all environments (elementary to adult).
- Instructional games should not be very complex, so the rules don't interfere with content learning.
- Game contexts are engaging and heightened involvement correlates with better learning; formats should force students to make new associations and acquire new information.
- Uncertain outcomes/events heighten interest and anticipation; various levels of challenge are positive.
- Game effects are hard to objectively measure, so incidental learning should also be considered.
- Debriefing during and/or after a game is very important.
- Gender preferences should be considered since girls tend to be less competitive.

Relevant PowerZone features:

PowerZone is an instructional software game, intrinsically rewarding, and can be used in many ways, such as a basis for cooperative learning and peer tutoring and raising enjoyment and self-esteem in the classroom. It is ideal for practice and drilling of content skills and for acquiring new information through cooperation and competition. It recommends use in conjunction with regular content activities, is easy to use, involves all students, and incorporates frequent class discussions. PowerZone also employs some fantasy-based concepts and has chance events. It appeals to both boys and girls.

***Relevant Research Studies:* Refer to Appendix A**

Strategy: Cooperative Learning in the Classroom

Summary of sample research studies:

- Cooperative learning is a teaching strategy involving students in group learning activities that promote positive interaction. It is a team-based, high performance organizational structure in which learning is dependent on the exchange of information among students, and each learner is held accountable and motivated to increase learning.
- Key components include positive interdependence, team formation, accountability, social skills, structures, distributed leadership, group autonomy and processing, and face-to-face interaction.
- Cooperative learning is one of the most thoroughly and well researched strategies available in the classroom. It has been found to have the most powerful and positive influence on instructional outcomes—it increases academic achievement and higher level thinking and retention (problem solving, decision-making, and critical and creative thinking).
- At the middle school level, student motivation, interest, and socialization may be increased through peer support and interaction; benefits can be extended beyond the classroom.
- At all levels students feel more empowered, improve self-esteem, have more productivity, and tend to form a more democratic classroom.
- The structure can be implemented in all subject areas relatively easily and cheaply; it may improve behavior and increase liking of school and attendance; and it builds positive relationships among students.
- Cooperative learning must be distinguished from traditional classroom grouping and skillfully implemented to work effectively with all student abilities; teaching strategies include management of groups, creating specific and thinking tasks, and communicating with other teachers and administrators.
- Activities may be combined with a competitive format to enhance motivation.

Relevant PowerZone features:

The PowerZone format creates an excellent structure for a cooperative learning activity in a competitive, spirited atmosphere. Students interact and work together in teams to answer more content questions correctly than another team. Students may contribute without feeling they are singled out for an incorrect answer. Through an organizational framework, teachers can ensure all students participate in the teamwork. PowerZone is also flexible, so group members can be easily changed to optimize learning situations, motivation, and group functioning. Through its team structure, PowerZone also provides opportunities for leadership among all students, thus enhancing self-esteem and peer interaction.

Relevant Research Studies: Refer to Appendix A

Strategy: Peer Tutoring

Summary of sample research studies:

- The use of peer tutors has been an educational tool for centuries; the literature overwhelmingly supports the use of peer tutoring in the classroom as a highly effective instructional strategy if all students involved have proper training in their roles.
- All students may serve as both tutors and tutees, regardless of their abilities—from the gifted to the at-risk; the tutoring situation, itself, provides many advantages for both students.
- A good recommendation is to keep tutoring situations fluid, flexible, and ever-changing, so that no one student or group of students is perceived as “always giving” or “always receiving” help.
- Manipulating such factors as age, location, and ability do not affect the primary outcome, which is opportunity to respond.
- Main features include providing immediate feedback and clarification of information; learning in a non-threatening environment; increased use of critical thinking, interpersonal, conflict resolution (sociability), and communication skills; and decreased absenteeism, drop-out rates, and emotionally driven behaviors.
- The advantage of using peers over adult tutors concerns better ability to relate to the tutee on a cognitive, emotional, and social level.
- Problems to address in establishing a tutoring program include student training, adhering to protocols by teachers (such as properly supervising activities), administrative support for teachers, frequency of use of the program, matching between tutors and tutees, and content preparation by the tutor.
- Peer Tutoring is highly cost effective, based on such factors as positive outcomes, amount of training, and teacher planning and supervision time.
- Classroom work can progress at a timely rate since peer tutors can help students who have fallen behind.

Relevant PowerZone features:

The PowerZone format is ideal for use with a peer tutoring program. Because of its game context, ease of independent use, and thorough coverage of a specific topic, teachers can assign PowerZone to tutoring groups and have confidence that the tutor and tutee are engaged in content review. Using PowerZone saves the teacher time in devising materials for tutoring situations, since the thoroughly researched questions pinpoint the important concepts and facts. PowerZone also lends itself to reversing the tutor-tutee relationship, since answer choices are presented and hints for wrong responses may quickly cue those tutors who lack confidence with the material.

PowerZone is motivating for learners of all abilities, so it presents a positive basis for a tutoring relationship. For those students who have fallen behind and need extra work, PowerZone is an ideal way to review with a peer in a meaningful and fun atmosphere.

APPENDIX

Sample Research Documents

Numerous studies exist that pertain to the strategies addressed in the PowerZone research summary. Especially pertinent ones are cited and organized according to topic and referenced in the ERIC Clearinghouse database with an ED (ERIC digest) or EJ (ERIC journal) designation; all reports and many additional references can be found on the AskEric (www.askeric.org) website.

ERIC NO.	TITLE	DATE
----------	-------	------

Motivation

ED407056	Improving Academic Motivation—1995	
ED359166	Toward Creating the Intrinsically Motivating Classroom: Can Students' Motivational Orientations Be Changed?—1993	
ED362952	Winners Without Losers: Structures and Strategies for Increasing Student Motivation To Learn—1993	
ED363613	Science Centre Education. Motivation and Learning in Informal Education. Research Report 119—1993	
ED465391	The Relationship Motivation and Academic Success of Community College Freshman Orientation Students—1999	
ED323936	Providing Practice Using Instructional Gaming: A Motivating Alternative 1990	
ED446819	Teaching Strategies To Improve Student Motivation—2000	
ED369773	Motivation To Learn: From Theory to Practice—1993	
ED410197	Improving Student Motivation. A Guide for Teachers and School Improvement Teams—1997	
ED442751	Powerful Classroom Management Strategies: Motivating Students to Learn—2000	

Gaming

ED368345	Instructional Gaming: Implications for Instructional Technology—1994	
ED090927	Games and Teams: An Effective Combination in the Classroom—1974	
ED323936	Providing Practice Using Instructional Gaming: A Motivating Alternative—1990	
ED133315	Teams-Games Tournament: A Final Report on the Research. Report NO. 217—1976	
ED394500	Instructional Applications of Computer Games—1996	
ED102036	Simulations/Games in Social Studies: A Report. SSEC Publication No. 164—1974	

- ED088417** Toward a Theoretical Model of Learning As It Relates
To Simulation Games With Discussion—1974
- ED438169** The Use of Educational Simulation and Gaming
To Improve Mathematics Teaching—1989
- ED267623** In Pursuit of Trivia—Game Theory and Research Skills—1985
- EJ532496** A Fun Alternative: Using Instructional Games to Foster Student Learning—1996

Cooperative/Competitive Learning

- ED302866** Cooperative Learning in the Middle School—1989
- ED379263** Cooperative Learning in the Classroom—1994
- ED437840** A Brief Introduction to Cooperative Learning—1999
- ED437841** What Makes Cooperative Learning Work—1999
- ED369146** The New Circles of Learning:
Cooperation in the Classroom and School—1994
- ED369778** Learning Together and Alone. Cooperative, Competitive, and Individualistic
Learning. Fourth Edition—1994
- ED468999** The Teacher's Sourcebook for Cooperative Learning: Practical Techniques,
Basic Principles, and Frequently Asked Questions—2002
- ED408570** Cooperative Learning in the Thinking Classroom:
Research and Theoretical Perspectives —1997
- ED351207** Using Cooperative Learning in Science Education—1993
- ED373509** Ability Grouping and Cooperative Learning—1994
- ED222489** Cooperative Learning: Student Teams.
What Research Says to the Teacher—1982
- ED452265** Using Cooperative Learning in a Middle School Computer Lab—2001
- EJ546296** Get Ready, Get Set, Go Read! Motivation Through Competition—1997
- ED382596** Cooperation-Competition: An Instructional Strategy. Fastback 378—1995
- EJ420716** Cooperative Learning as an Agent of Inquiry—1990
- ED391580** Improving Primary Student Motivation Through the Use of Cooperative
Learning Strategies and the Teaching of Organizational Skills—1995

Peer Tutoring

- ED430959** The Effectiveness of Peer Tutoring in the Elementary Grades—1999
- ED438267** Effectiveness of Cross-Age and Peer Mentoring Programs—2000
- ED457224** Peer Tutoring: An Effective Instructional Strategy—2001
- ED345459** Peer Tutoring: When Working Together Is Better Than Working Alone.
Research & Resources on Special Education, No. 30—1991
- ED354608** Peer and Cross-Age Tutoring—1993
- ED362506** Peer-Tutoring: Toward a New Model—1993
- ED387568** Turning Potential School Dropouts into Graduates: The Case for School-
Based One-to-One Tutoring Research Report 95-07—1995
- ED118543** Peer and Cross-Age Tutoring in the Schools:
An Individualized Supplement to Group Instruction—1975
- ED289949** Peer Helping Relationships in Urban Schools—1987
- ED327755** The Case for Peers—1990

LMS™

Learning Multi-Systems, Inc.

1402 Greenway Cross • Madison, WI 53713
1-800-362-7323 • Fax 608-273-8065

www.lmssite.com