Afterschool Beginner Chess Program

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Abstract

The following instructional design has been prepared for The Afterschool Beginner Chess

Program (chess program) which will teach chess to students in grades three through six who do

not yet know how to play. The program will also identify and support social skills needed to

successfully focus and persist through the game. Instructional design stages of analysis, design,

development, implementation, and evaluation of the program (ADDIE) have shaped this design.

Morrison, Ross, and Kemp's models (2007) have been consulted to enable front end analysis,

implementation, and evaluation. Merrill's model (2002) within his principles of instruction has

been used for organizing instruction. Brown and Green (2016) have offered other explanations

and models for designing, developing and evaluating this program design. The chess program

has been tested on a small group of learners. By the end of the fourth session all were able to

play chess and to participate in a chess tournament with more advanced players. In addition, all

beginner level participants had become aware of and found appreciation for associated social

behaviors needed to focus on and persist throughout the game of chess. This design, once

implemented on a larger scale, will consider further study and evaluation.

The Afterschool Beginner Chess Program (chess program) will address *behaviors* in the cognitive and affective domains (Gagne & Merrill, 1990). Gradual knowledge building with periodic practice will support the goal and objectives of instruction. Discussion and role playing will enable strategies to control frustration and enable persistence; reminders about courteous treatment of the opponent will be supported by guided practice.

Section I

Content area, level, topic, and instructional goal. Goalsetting for the chess program is determined from the *approach* prescribed by a subject matter expert (SME) (Dick, Carey, & Carey, 2009 as cited in Brown & Green, 2016, p.92). In the educational setting the instructor may serve as both SME and instructional designer (Morrison et al., 2007, p.77). In the chess program, the instructor, who knows how to play chess, will teach students who are new to the game, how to play chess.

The instructional *goal* describes the "ultimate intention of instruction" (Brown & Green, 2016, p.98). The goal is this: Students in grades three through six who are voluntary participants in an afterschool activity will demonstrate understanding of the game of chess and become aware of associated social behaviors which support game playing best practices, all within the setting of a weekly chess club.

The instructional *objectives* are more specific statements about "how and to what degree the instruction will affect the learners" (p.98). Audience, behavior, conditions, and degrees (ABCDs) have been considered when setting objectives (Heinich, Molenda, Russell, & Smaldino, 2002 as cited in Brown & Green, 2016, p.92).

Audience will be the third through six grade learners.

Behavior. At the end of the preliminary chess instruction sessions (first three session), participants will have learned moves of all the chess pieces and necessary vocabulary and have identified social behaviors important to playing the game. They will have:

1. Observed moves of specific chess pieces,

2. Participated in discussions using chess terminology and vocabulary,

3. Set up a chessboard with growing independence,

4. Discussed ways to avoid frustration when learning a new task or waiting to take their turn,

5. Reviewed ways to be courteous to the opponent before, during, and after playing a game, and

6. Learned and participated in a game related to specific pieces and pawns.

By the close of the fourth meeting, participants will have learned to play chess with an introductory understanding of the strategy of the game and practiced social behaviors important to success playing the game. They will have:

1. Observed a chess problem,

2. Discussed and experimented with simple chess openings and endgame strategies,

3. Played chess games with peers and with a more advanced player,

4. Discussed how to avoid or minimize frustration,

5. Participated in self-evaluation opportunities, and

6. Discussed examples of courtesy to the opponent.

Within *conditions* of performance, Morrison et al. (2007) describe terminal objectives, which describe the major tasks, and enabling or supporting objectives, which describe the specific behaviors. This design identifies two terminal objectives with enabling objectives:

1. To move from introductory level to beginner level chess playing.

   a. Learner can set up the board independently,

   b. Learner can correctly move each piece with reminders,

   c. Learner can recognize when to take a piece or to protect a piece, and

   d. Learner can understand basic chess vocabulary.

2. To develop strategies to reduce frustration level and treat opponent with courtesy.

   a. Learner can recognize frustration when learning new tasks,

   b. Learner can recall strategies to minimize frustration and persist through

   the game, and

   c. Learner can recall ways to treat the opponent with courtesy.

The *degree* or standard for acceptable behavior is that students will move from an introductory level to a beginner level of chess playing ability while recalling appropriate social skills within the four session chess program.

Needs Analysis. Learning the game of chess has proven to have positive effects on academic skills (Sala & Gobet, 2016). In addition, chess playing can increase persistence and improve social intelligence and self-esteem (Fine, 2014; Aciego, Garcia, & Betancourt, 2012; Storey, 2000).

The needs assessment will collect data based on students' learning behaviors and social skills in the classroom. Morrison et al. (2007) treats the process of needs assessment "as if it were a study" (Brown & Green, 2016, p.49). Students who will participate in the class do not know how to play chess, may have trouble focusing and staying on task, and are all in a position where there school is closing at the end of the year and they are transferring to new schools. The identified need is that these students, though old enough to learn how to play chess, will need

extra support to focus and to stay on task while learning the rules and practicing the chess moves. [Dr. LW suggests that Smith and Ragan might have been a better fit, "as their model assumes that the goals have already been set and thus helps to identify what the gaps are in how well the students are currently meeting the goals (L.W., 2017)." Finding the learning gaps might better suit development and implementation of instruction.] Morrison et al. (2007, p.37) take the assessment through four stages: planning, collecting data, analyzing data, and preparing the final report.

Phase I (planning) considers the following:

a. *Target audience* [parents and teachers of third through six grade learners]

b. *Strategy*: Data sampling of teachers and parents whose students are interested in learning chess

c. *Analysis*: Survey perceptions of current needs [include measures of persistence and frustration when learning a new task].

d. *Participants:* Use a modified Chicago survey (Federation for Community Schools, 2015) which contains questions for parents and for teachers (See Appendix I for sample questions).

The model continues through phase II: collecting data (sample size and scheduling), phase III: data analysis (analysis and prioritization), and phase IV: final report (purpose, process, results and action).

The Chicago survey (Appendix I) provides a template for questions to address key issues of program needs, transportation, and student interests. Its findings may provide answers within Rossett's model of questions (2012, Analysis Basics section, para.7) to determine the total picture of the program needs and determiners (see Appendix II for Rossett's questions and some

predictors of results). [Dr. L.W. comments that "much of this paper's needs analysis work is focused on the program level, rather than the learning level. "Issues of transportation and recruitment to the program are not an instructional designer's problem. The instructional designer focuses only on creating the curriculum. They talk to parents and teachers to the extent that it could help provide information about instructional issues related to learning chess. A needs assessment analysis, a requirement for the project, was not done.]

Learner analysis. Morrison et al. (2010, as cited in Brown & Green, 2016, p.82-83) considers contextual analysis and learner characteristics by creating a "typical" group member and a learner profile. [Dr. L.W. wanted an actual survey conducted and actual results; though surveys are described and examples in the appendix, the study results are not clear enough]. Teachers often do this when using a student in the class to gage level of and success in delivery of instruction. [After examining results from a teachers survey shown in Chicago survey referred to Appendix I, t]he chart would look like this:

Data type	Challenged learners	Average learners	GT
Reading ability	30 %	60%	10%
Maturity level	70%	25%	5%
Mechanical diversity	30 %	40%	30%

The learner profile could describe an average fifth grade student boy who enjoys reading, playing golf and baseball, but can enjoy indoor activities like video games. He is taking the chess program to learn how to play with his grandmother who has just given him a computer chess game so he can play alone or with another person. His parents are encouraging him and providing transportation, hoping that he might make friends and attend better in the classroom.

The latter is supported in research. In a study by Aciego, Garcia, and Betancort (2012) students who participated in chess regularly had better coping skills and problem-solving strategies (p. 558).

After considering the imagined learner profile and imbedding participation and technology into the four sessions, it can be predicted that engagement in the chess program should be high. Brown and Green (2016, p.84) suggest that the learner analysis should help answer questions about intended audience, common traits, differences, range of ability, and motivation for participation. In addition, considerations for non-instructional needs, effective delivery of content, accommodations for diverse learners, and evaluation strategies should be in place. The latter is accomplished with planned formative assessments and instructor observations to decide whether to continue to next level or to reteach content as needed. Appendix III offers a means for per session assessments which determine whether to reteach or to move forward.

Contextual analysis. "Embedding the instruction in a familiar context enhances both student achievement and student attitudes" (Morrison et al., 2007, p.63 [multiple works support this statement and are cited in the text]). To inform contextual analysis, the program considers learner attitude and motivation, environmental factors, and knowledge transfer (Nichols, Walsh and Yaylaci as cited in Ritzhaupt, 2014).

Some considerations include the following:

- Students in grades three through six often have trouble focusing, staying on task, or working to complete an activity or project when in a classroom setting,

- Students are interested in learning how to play chess after school,

- Students in grades three through six are at an age when they can identify and practice, steps to focusing, staying on task, and working to complete an activity,

- Students in this age range need a lot of opportunities to move around,

- There is academic data available to determine student academic level,

- Teachers can provide data on student classroom behaviors with sliding scale with

  indicators below:

  - 1. Needs to be reminded of rules --------------sensibly follows rules independently

  - 2. Does not take corrections --------------------------is receptive to corrections

  - 3. Gives up easily ---------------------doesn't give up when encountering difficulty

  - 4. Does not finish assignments -------------is persistent to complete an assignment..

Based on the information that describes the learner, the design for the chess program describes an afterschool activity which will happen in a quiet room adjacent to the school, with time for talk, bathroom and water breaks, with comfortable temperature and lighting. When they are tired of sitting, learners are invited to stand, stretch or walk around. Each group is given a chess clock; the button can be hit when each player makes a move. Pretzel snacks are offered. Each session begins with an independent activity and discussion about real or imagined ways to decrease frustration and increase focus and persistence. By the fourth session, a chess problem is introduced after the independent activity (setting up a chessboard) has been completed.

Standards met in week three are listed below. The Pebble in the pond progression of problems is listed in Appendix IV. Bardwick (2010) has suggested general math standards for early grades in his book, *Teaching Chess in the 21st Century.*

Table 1: Standards met in Week 3		
Educational standards	Description	Instructional Objective
AASL		
3.1.2	Participate and collaborate as members of a social and intellectual network of learners.	Students self-evaluate and discuss strategies to increase persistence, control frustration, act courteously.

3.1.4	Use technology and other information tools to organize and display knowledge and understanding in ways that others can view, use, and assess.	Students self-evaluate and discuss strategies to increase persistence, control frustration, act courteously.
3.2.2	Show social responsibility by participating actively with others in learning situations and by contributing questions and ideas during group.	Students self-evaluate and discuss strategies to increase persistence, control frustration, act courteously.
Common Core		
CCSS.Math. Content.5.OA.B.3	Operations & Algebraic Thinking/Analyze patterns and relationships.	Students begin to understand puzzle notation; students practice algebraic notation.
CCSS.ELA-Literacy.SL.5.1	Engage effectively in a range of collaborative discussions.	Students self-evaluate and discuss strategies to increase persistence, control frustration, act courteously.
ISTE		
2d	Communication and collaboration	Use technology to record, view and discuss behaviors.
4a and d	Critical thinking, problem solving, and decision making.	… discuss strategies …

Formative evaluation plan. [Dr. L.W. says, describe model; Morrison et al. used several and best to refer to the one used]. The following observations were made within the test group, which included two boys and one girl. After four sessions, students were able to play chess against a more advanced player. Still unable to build to checkmate, students observed examples of how to move pieces to checkmate the king within a chess problem and within actual games. Through instructor questioning and students practice and discussion about move alternatives, students were able to see the results of careful defensive and offensive strategies to put the opponent's king in checkmate.

Evaluation of the program will include student assessments both formative and summative that will mark progress on the cognitive skills before program, during the program and at the finish of

the program. A Likert-type scale (Brown & Green, 2016, p.149) will measure progress in affective/attitudinal behaviors of persistence, patience, and courtesy and mark improvements after modeling, discussion, visualizations, and role playing. [Dr. L.W. comments: "But formative evaluation here is meant to evaluate your progress in the instructional design process, rather than student learning. You test out the instructional materials, pilot your instruction, and get feedback on things like were they able to understand the instructions, did they enjoy the activities, etc. These steps that you've outlined are good examples of formative evaluation of student learning."]

Participants in the test group were asked what was missing from the sessions. Students felt that they learned what they needed about playing chess as a beginner, but they needed to do more with chess problems and strategies to checkmate. Intermediate level classes (following those within this program) could begin with a problem and a skill review followed by practice games [Dr. L.W. comments, "this is a good example of what Dick and Carey call learner validation."]

It is hoped that an evaluation completed by teachers back in the students' classroom would result in some positive behavior changes. This evaluation would determine whether the attitudinal portion of the initial goal for instruction was transferrable and learned.

Formative assessment would inform the general sequence of instruction. A general checklist based on a sequence of steps (including those in Table 3 and 4) would determine if instructional objectives were met:

Week I: Pawn game learn and practice with pawns and bishops. Students discuss examples of when frustrated and what could be done to prevent or reduce frustration.

Week II: Students are introduced to knights and rook and practiced moves. Students

imagine times that they learned something new and it was difficult; discuss

strategies to persist and to learn..

Week III: Students view examples of playing Pawn game and recall ways that they took

time to make a move. Students are introduced to the queen and king and talk

about algebraic notation. Students give examples of how they use wait time when

opponent is taking time to make a move. Students play a game with all the pieces

using Pawn game rules.

Week IV: Students view a chess puzzle where in one move the opponent's king is in

checkmate; students noticed best moves. Students set up the board and play a

game of chess with a more advanced player. Students practice best social

behaviors and begin to think about importance of focusing and persistence when

thinking about and moving a piece. Students practice with each other, playing

chess with all the pieces.

Week V: Students participate in a tournament with more advanced players. Practice

focusing and courtesy (shake hands at the end of the game).

Summative Evaluation Plan. "Summative evaluation is directed toward measuring the

degree to which the major outcomes are attained and by what course" (Morrison, et al., 2007,

p.239). [Dr. L.W. comments, what model]. When considering the analysis of the chess program

success, one would look at learner performance ratings. Given a checklist of skills, students

would be rated on how well they could perform each skill. After the first session, performance

can be measured as described above, by a sliding Likert-type scale, as previously mentioned

(Brown & Green, 2016, p.149) to determine whether *content* is understood. Various skills are

measured below using this measurement: 1. Cannot recognize or use, 2. Uses or recognizes but

needs support, 3. Can use or do independently. Evaluation would analyze the program's delivery

of content and help to improve future delivery.

Table 2: Summative Evaluation, Week 1	
Chessboard set up	
Moves pawn 2 on first move	
Takes a piece with a pawn	
Moves pawn forward only	
Shows persistence	
Shows courtesy to opponent	
Moves to take a pawn with "en passant"	
Vocabulary (rank, file, names of pieces)	

Specific analysis will refer to weeks one or three of the chess program. The first week

will be important to teach a game to enable practice when moving each chess piece. The third

week blends key strategies to enable students to use learned knowledge, move pieces correctly,

and begin to play a game of chess.

Task analysis. The chess program considers concepts, rules, interpersonal skills, and

attitudes in its design. A task analysis gathers "information about content and/or tasks that need

to be part of the instruction being developed" (Brown & Green, 2016, p.60). Morrison et al.

(2007) writes that task analysis "solves three problems" it defines content, identifies subtle steps,

and considers the learner's perspective in order to "gain insight into appropriate teaching

strategies" (p.76).

This design will examine content structure with a procedural analysis model described by

Morrison et al. (2007). The "process breaks tasks into the size of steps needed for learning"

focusing on observable tasks (p.82). Each step considers three questions (p.83):

- What does the learner do?

- What does the learner need to know to do the step?

- What informs the learner of progress or problem, that a step is done, or that a new step is needed?

The instructional goal in week 3 is that a student will be able to demonstrate an understanding of simple chess openings, castling, and use of chess notation. Students receive support in the cognitive and affective domains as shown below in the ordered steps. [Dr. L.W. liked this part]. Table 3 and Table 4 (adapted from an example in Brown & Green, 2016, p.91) provide steps to objectives that relate to the goal of instruction.

Table 3: Steps to cognitive objectives Week 3	
Objective	Students will use chess notation to describe the location of pieces on the board
Step	Students recall using coordinates in math class and in battleship game
Step	Students will describe location of pieces on the chessboard using coordinates
Step	Students will notice that algebraic notation can be used to describe chess piece positions
Step	Students will move knight and describe new location in algebraic notation
Step	Students will describe locations of other chess pieces using algebraic notation

Table 4: Steps to affective objectives Week 3	
Objective	Students self-evaluate and discuss strategies to increase persistence, control frustration, and act courteously
Step	Students review courteous behaviors in a discussion setting
Step	Students self-evaluate and discuss a personal strategy to help focus, persist in a difficult task, or control frustration at doing something difficult
Step	Students role play one example that helps avoid frustration when learning new information
Step	Students imagine examples of strategies to increase persistence when learning new information
Step	Students give examples of one new, shared strategy that they will try

A critical incident method (Morrison et al., 2007, p.89) which considers the attitudinal objective, will imbed interviews and discussion into the program. Students have opportunities - in one on one or in group discussion - to consider causes of frustration, how frustration can prevent playing the best game, and the value of positive choices when controlling frustration (e.g. increase in focus and persistence, better choices, chance of winning game).

Instructional Strategies. Merrill's model (2012) can be used to illustrate each stop in the progression of skills. The instructor will demonstrate, question, show information a different way, and ask students to practice the new skill or knowledge. This works well for the knowledge level portion of the instruction.

Table 5: TASD for Week 1				
	Tell	Ask	Show	Do
Information about	Instructor shows students how to set up a chessboard	Students set up, notice mistakes, correct mistakes	Instructor demonstrates, reteaches, corrects	Students independently set up chessboard and cooperate or support each other
Parts of	Instructor introduces names of pieces, other vocabulary	Students understand the use of the terminology and vocabulary and follow the direction	Instructor uses the vocabulary and points to pieces, or demonstrates a move, or points to the chessboard when using the words	Students *use* the vocabulary when describing a move.
Kinds of	Academic vocabulary includes: Ranks, files, names of pieces, names of strategies	Students practice using vocabulary	Instructor repeats and practices	Students us vocabulary when describing a move or moving a piece
How to	Instructor shows how to move pawns and how to play the Pawn game; instructor shows how pawns take pieces on the side.	Students practice moving the pieces	Instructor reviews	Students play Pawn game
What Happens	Instructor reviews the Pawn game and introduces the bishop; shows how to move bishops	Students play the Pawn game and add the bishop to the game.	Instructor reviews Pawn game and pawn moves introduces a new piece, the bishop (how bishop moves, value compared to pawn, etc.)	Students learn Pawn game and transfer skill when practicing with more advanced pieces

Events of Instruction. Using a simple approach described in Brown and Green (2016, p.104) the design incorporates elements from instructional designers such as Posner (2003), Smith & Ragan (2005), and Gagne (1985) (cited in Brown & Green, 2016). See table 6.

Table 6: Events of Instruction for Week 1	
Introduction	Motivation: Students set up chessboard with help of Instructor; students recall times when they had to learn something new and strategies for persisting although it was difficult; students discuss methods to show courtesy to an opponent.
Body	Lesson: Instructor demonstrates chessboard setup Students set a chessboard correctly. Instructor points out that white square is on the right; queen is on color (white on white, black on black); bishops on either side of royalty, knights follow, then rooks; pawns are in the second rank (Columns are files; advancing within the columns are advancing the ranks). Students notice that information; may touch or point to pieces to enable kinesthetic recall. Instructor shows that pawns can move only forward and take from the side; first pawn move may be two or one space, after first move pawns only move one space. Students move pawns to give an example. Instructor removes all pieces from the first rank, leaving only pawns, explains Pawn game (move only pawns, take pieces, try to advance to be promoted (the final rank). First to be promoted or the one with more pawns remaining wins the Pawn game.
Conclusion	Activity: Students practice pawn moves with the Pawn game. Exhibit courteous behavior; demonstrate ability to persist through activity and learn a new game.
Assessment	Observation/checklist: Did student take opponent pawn? Did student move one pawn two spaces for first move? Did student move pawn to final rank to be promoted? Did student notice mistakes and correct them? Did student demonstrate courtesy toward opponent? Discussion: Did students use strategies to persist through learning a new game and playing fairly and courteously against an opponent? See Appendix III for assessment for week 1

Smith and Ragan (2005 as cited in Brown & Green, 2016, p.105) describe that an instructional event has a supplantive and a generative aspect; in this design the instructor

presents information and activities (supplantive) and the students respond to information and

activities by participating, questioning, practicing, and discussing moves and strategy

(generative).

The instructional design uses a constructivist approach to develop instruction that will

teach to the learners' cognitive and intellectual domains. Marzano (2000, as cited in Brown &

Green, 2016, p.33) describes the constructivist approach: "learners use their prior knowledge to

construct a personally meaningful understanding of new content."

Gagne and Merrill (1990, p.24) write that "when instruction is considered in the more

comprehensive sense of a module, section, or course [then] multiple objectives commonly

occur." Here there are multiple mini-lessons within the course. To reach the final goal and to

teach to the cognitive and the attitudinal domains, there will be multiple objectives.

Posner and Strike (1976 as cited in Morrison, Ross and Kemp, 2007, p.132-133) write

about learning-related sequencing of the steps that will help the learner achieve multiple

objectives within the *cognitive* domain. The instructor uses the model over four sessions:

1. Introduce skills that relate to what the learner already knows (vocabulary,

    chess/checker board).

2. Make sure to work with what is already familiar to the learner and then proceed

    to what is new (students may know how to move some of the pieces and know

    some of the names of the pieces).

3. Teach from less difficult before the more difficult (begin with an easier game for

    practice, recall and use pawn and bishop first).

4. Keep topics interesting (each learner practice setting up the board independently,

    use chess clocks to play the practice games).

5.   Observe learner progress and teach new topics when the learner is ready.

To teach to the attitudinal objectives, the instructor will consider "prescriptions for teaching interpersonal skills" (Morrison et al., 2007, p.158) and use a strategy based on Bandura's (1977) social learning theory which involves four steps.

1.   Initial modeling of the behaviors by instructor,

2.   "Verbal and imagined" model of the behavior,

3.   Examples to provide a mental rehearsal of the behavior, and

4.   Overt practice like role-playing.

Rehearsal of the steps to improve good practice are recommended (p.159).

Progression of problems in week 3 can be found in Appendix IV. The chess program topic is composed of intellectual skills and affective skills so the chess program continues with the learning-related sequencing and attitudinal support as it builds on previous knowledge and experience.

Progression of Problems. Merrill's "content-centered"approach (2002) is used to determine the progression of problems used in the instructional design (see table 7a). The outcome of the first session of the chess program will be to learn the Pawn Game so that it can be used for practice. As students learn the moves of each piece on the chessboard they practice the moves in a simple game with pawns. A second outcome of the first session is to begin to think about positive social behaviors that will enable best practices when learning and persisting through steps to learning a new task.

Merrill (2002) describes that his Pebble-in-the-Pond model "consists of a series of expanding activities" (p.40) starting with the whole task or problem that the learners will be accomplishing.

Skills and knowledge for the first lesson's progression of problems are listed in table 7b.
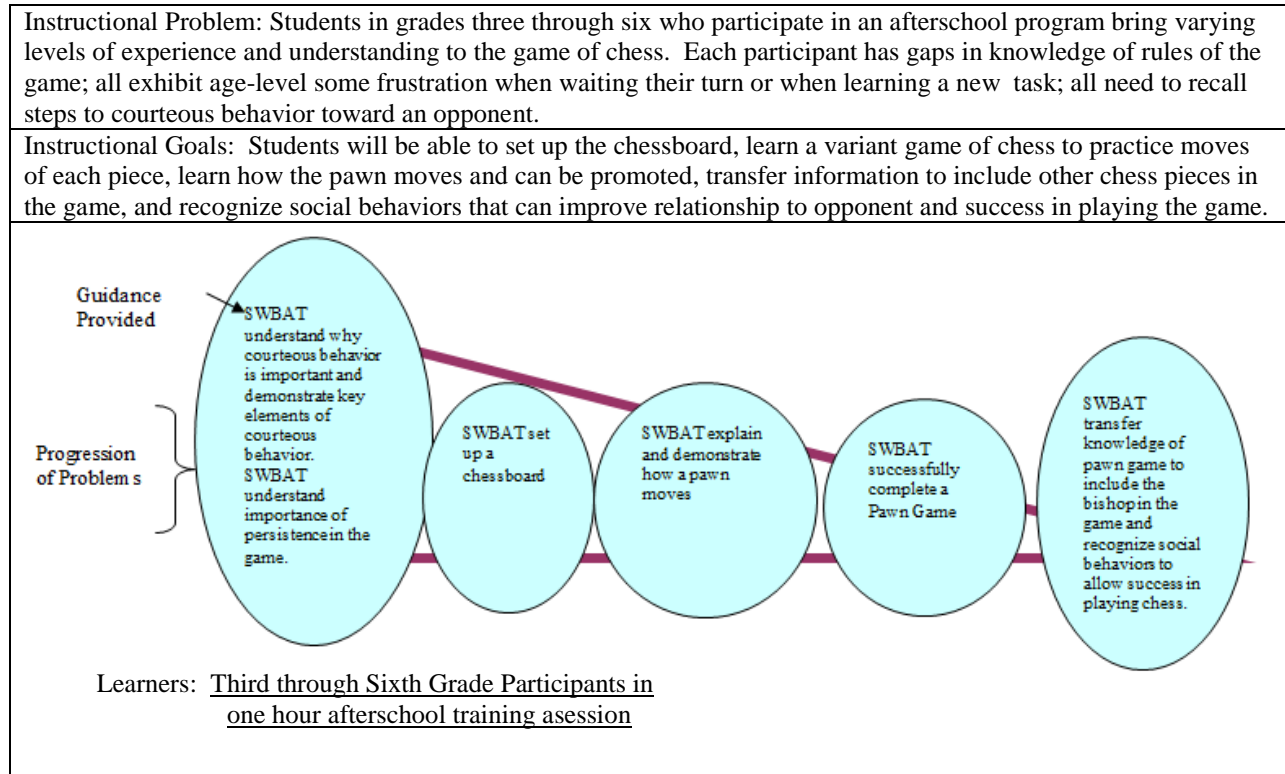
Instructional Problem: Students in grades three through six who participate in an afterschool program bring varying levels of experience and understanding to the game of chess. Each participant has gaps in knowledge of rules of the game; all exhibit age-level some frustration when waiting their turn or when learning a new task; all need to recall steps to courteous behavior toward an opponent.

Instructional Goals: Students will be able to set up the chessboard, learn a variant game of chess to practice moves of each piece, learn how the pawn moves and can be promoted, transfer information to include other chess pieces in the game, and recognize social behaviors that can improve relationship to opponent and success in playing the game.

Guidance Provided

SWBAT understand why courteous behavior is important and demonstrate key elements of courteous behavior. SWBAT understand importance of persistence in the game.

Progression of Problems

SWBAT set up a chessboard

SWBAT explain and demonstrate how a pawn moves

SWBAT successfully complete a Pawn Game

SWBAT transfer knowledge of pawn game to include the bishop in the game and recognize social behaviors to allow success in playing chess.

Learners: Third through Sixth Grade Participants in one hour afterschool training asession

Table 7b: Skills and Knowledge Week 1					
	Pebble 1	**Pebble 2**	**Pebble 3**	**Pebble 4**	**Pebble 5**
Skills (Need to be able to do)	SWBAT understand why courteous behavior is important . SWBAT demonstrate key elements of courteous behavior. SWBAT understand the importance of persistence in the game of chess	SWBAT set up a chessboard	SWBAT explain and demonstrate how a pawn moves	SWBAT successfully complete a Pawn Game and will observe en passant	SWBAT transfer knowledge of Pawn game to include the bishop in the game and recognize social behaviors to allow success in playing chess.

Table 7a: Pebble in the Pond Week 1

Knowledge (Need to know)	Students can give examples of courteous behaviors. Students know strategies for dealing with frustration. Students know ways to show courteous behavior to another chessplayer. Students know and practice persistence in playing a game.	Students know that the white square must be on the right when setting up the board. Students know that queen goes on color. Students know how to set up pieces on a chessboard.	Students know that the pawn moves forward . Students know that a pawn takes pieces on the diagonal. Students know that a pawn may move 2 spaces on the first move. Students know that the pawn can advance to the 8th rank and be promoted to a stronger piece or a queen.	Students know how to play a Pawn game to practice pawn moves. Students know that sometimes the pawn may take a pawn in en passant (pawn moves first two spaces but opponent pawn may take as if pawn has only moved one space)	Students know how to play the Pawn game with a new piece, the bishop. Students know that the bishop moves diagonally. Students know that the bishop only moves on black or white squares. Students recall strategies to lessen frustration and to improve concentration. Students recall ways to treat opponent courteously.

In week one, the initial objective is to learn a simple game to allow for practice when learning the moves of each chess piece while also examining and improving social behaviors to lead to success in the enterprise. Using Merrill's terminology (p.40-41) the initial problem ripples out: students *analyze* social behaviors (affective domain) and identify *component knowledge* (p.41) of board arrangement and moves of pawn pieces (cognitive domain). The instructor will demonstrate board arrangement, allow time for individual practice setting up the board, and direct teach the pawn moves. Learners will practice playing the Pawn Game, a game with only pawns where the winner advances the pawn to the highest rank (Chevannes, 2013). The instructor will observe and correct mistakes.

Learner Evaluation. "Determining if a learner has reached a high level of success is accomplished through learner evaluation" (Brown & Green, 2016, p.129). This program will use checklists, interviews, observations, and anecdotal records to evaluate the change in knowledge level skill and the increase in affective performance of participants. Some of the content of assessments, already described, will be used in the evaluation (e.g. see Appendix III).

Morrison et al. (2007) suggests ways to evaluate attitudinal objectives within the program. Observing student interest with notes on student attitude is an example of observation/anecdotal records (p.296).

Student attitude	Low-1	Some-2	High-3
Interest in the lesson			
Attentiveness to lesson			
Active Engagement			
Positive affect (smiles, laughter)			

To enable student participation in learner evaluation, the instructor will videotape students while playing chess, preview and then show examples of positive behaviors exhibited so that students can see and talk about best practice. Students may increase their focus time with practice and support. The result of improved focus is improved concentration and improved game performance.

It is hoped that an evaluation completed by teachers back in the students' classroom will show that participation in the chess program resulted in some positive behavior changes. This evaluation could determine whether the attitudinal portion of the initial goal for instruction was transferrable and learned.

Evaluation of the instructional design can also take place when students participate in a small tournament with more advanced players. Table 8 shows specific cognitive and affective skills that will be observed. Students will also be asked to self evaluate.

Table 8		
Action	Support needed	Done independently
Movement of pieces		
Castling		
Pawn moves		
Courtesy to opponent		
Focus, persistence		

End Problem

The goal of instruction is that students in grades three through six who are volunteer participants in an afterschool activity will demonstrate understanding of the game of chess and become aware of associated social behaviors which support game playing best practices, all within the setting of a weekly chess club.

The interpersonal skills will be direct taught by modeling, role playing, imagined situations, discussion, self-evaluation and reflection, and practice. Content instruction will include rules, vocabulary, and practice within a game using only pawns. Front end analysis has determined need and support for a program. Further evaluation through teacher survey and interview may demonstrate that the experience has improved interpersonal skills and that has transferred to classroom behavior.

Conclusion

The Instructor acted as SME and Instructional Designer in the design of the Afterschool Beginner Chess Program. The test group participants enable an authentic evaluation of the design. It is expected that the goals of instruction can be met for this design if learner and environmental conditions are similar. Modifications would be made for learners who may begin by needing more structure, are hearing or visually impaired, or who have as yet unmet physical, social, or economic impairments which prevent full attention on the program. It is hoped that routine, minimal structure, snacks, and afterschool setting address the environmental needs of most of the learners. It is hoped that the emphasis on positive social behaviors will have a positive effect on each learner as needed.

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Appendix I

Chicago Survey Data Collection Instrument

I will use and adapt an instrument to determine interest and need for an afterschool activity that teaches the game of chess. The Federation for Community Schools in Chicago has a Community Needs Assessment which provides a sample 4th -8th grade student needs assessment (p.2-5), a sample student wish list (p. 9-11), a sample teacher assessment (p.12-13), and a sample parent interest survey (p.14-17).

The survey includes questions about

- demographics,

- school interest, and

- after school activities

There are also some questions about homework support, bullying and friends on the survey. This instrument could be administered to school students, teachers, and families by the school administration for the best collection of data. Information about student and parent interest in after school activities and interest in chess from the checklist would provide support for the program development. Other data of interest would include answers to questions related to school behavior and interest in and availability for afterschool activities.

- How has your behavior been at school in the last month?

    ____ I never got into trouble   ____ I almost never got into trouble

    ____ I got into trouble in class   ____ I got sent to the office

- What do you think would help you do your best at school?

    _____

- When you are not in school, do you … (e.g. Go to after school programs?)

___ yes   ___no   ___Sometimes   ___often

Appendix II			
Purposes of the effort	**How would it work? What questions might be asked?**	**Considerations**	**Instrument and Results**
The **substance** of the program	What is the essence of this product?	Students in grades three through six who are volunteer participants in an afterschool activity will demonstrate understanding of the game of chess and become aware of associated social behaviors which support game playing best practices, all within the setting of a weekly chess club.	
	Why was it developed?	Instructor is former teacher at the school with desire to help students recover some of the joys of their small school which will be closing in June, e.g. afterschool enrichment with friends, learn chess basics which can improve classroom skills through chess (persistence, focus, patience) Collective (teachers, parents, instructor) interest in helping students learn valuable social skills which help in educational setting; student interest in learning chess.	
	How does this product fit into organizational strategy?	The school goals are "challenging the mind, nurturing the spirit, and leading with faith and excellence." Goals of the chess club link to the first two.	
	Prior products and systems?	Earlier experiences are positive: students would like to learn, improve, and practice game and enjoy tournaments. Parents have shown high interest in and support for program.	

Purposes of the effort	How would it work?	Considerations	Instrument and Results
Support for the effort?		There is administrative and parental support and student interest in this beginner level program. Literature supports value of learning chess and improvement in academic behaviors which lead to success at school. Why small student sign up? Scheduling conflicts, small window of students offered the opportunity (grades 3-6 who are beginners only). Why only beginners? Instructor preference, crowd control, ease to teach a particular level. Why only 4 classes? Time constraints Willingness for students to continue club throughout the year and to have tournaments with varying levels of players. This beginner level program is a pilot program.	A Chicago survey can gather results of student, teacher, and parent interest and support.

Of 30 students eligible only 3 have signed up; there is higher interest but other afterschool commitments, parent schedule, and level of chess skill have kept another 10 students from signing up. |
| **Optimal Performance:** knowns | Does an individual who is performing at an optimal level know or do that allows them to perform at this level? | • Student will need to bring skills and knowledge to the chess club which include abilities to recognize chessboard and Chesspieces,
• desire to learn the game, and
• willingness to persist and show courtesy.

By the end, Student will be able to play a game of chess and persist to the close of the game, show courtesy to the opponent, and demonstrate a degree of independence during wait times between plays and while waiting for the next game opportunity. | |

Purposes of the effort	How would it work?	Considerations	Instrument and Results
Actual performance:	How is individual currently performing? What is happening to cause a particular event to take place?	Student has little or no knowledge of the game of chess. Student behavior is on a scale of needing reminders to engage and able to independently engage in the activity. Afterschool activity invites more casual behaviors; new skill invites low level of frustration; competitive spirit encourages mild aggressive tendencies; age appropriate social behaviors exist.	Pre-assessment: Teacher participation in the Chicago survey shows indicators of a frustration and persistence level of student participants before/early in the afterschool program. Does teacher notice improvement? (formative assessments)
Solutions	What solutions are possible?	Student will be able to play a game of chess and persist to the close of the game, show courtesy to the opponent, and demonstrate a degree of independence during wait times between plays and while waiting for the next game opportunity. Value of chess described in articles:	Post assessment/review by teachers may demonstrate improvement in social behaviors. Predictors from case studies described in research (Aciego, Garcia, & Betancort , 2012, p.558) shows that teachers notice improved coping skills in students who have participated in chess instruction and practice.

Appendix III
Learner Analysis
As well as ongoing evaluation checkpoints

After week 1 (knowledge/skills)

Student Name	Pawn takes to side	Pawn moves one or two on first move	Pawn moves forward only	En passant observed
1	x	x	x	x
2	x	x	x	x
3	x	x	x	x

1. Affective skills: needs much attention --------------------x-can observe or play without intervention
2. Affective skills: needs much attention -------------x-------can observe or play without intervention
3. Affective skills: needs much attention -------------x-------can observe or play without intervention

After week 2 (knowledge/skills)

Student Name	Queen on color	White space to right	Bishops and knights placed correctly	Rooks placed correctly	Opening observed	Castling observed
1	x	x	x	x	x	
2	x	x	x	x	x	
3	n	n	n	x	x	

1. Affective skills: needs much attention --------------------x-can observe or play without intervention
2. Affective skills: needs much attention -------------x-------can observe or play without intervention
3. Affective skills: needs much attention -------------x-------can observe or play without intervention

After week 3 (knowledge/skills)

Student Name	Board set up correctly	Bishop moves correctly	Knight moves correctly	Rooks moves correctly	Pawn moves correctly	Queen moves observed
1 (H)	y	y	y	y	y	y
2 (K)	y	y	y	y	y	y
3 (E)	n	y	n	y	n	y
4 (O)	y	y	y	y	y	y

1. Affective skills: needs much attention --------------------x-can observe or play without intervention
2. Affective skills: needs much attention -------------x-------can observe or play without intervention
3. Affective skills: needs much attention -----------x---------can observe or play without intervention
4. Affective skills: needs much attention --------------------x-can observe or play without intervention

After week 4 (knowledge/skills)

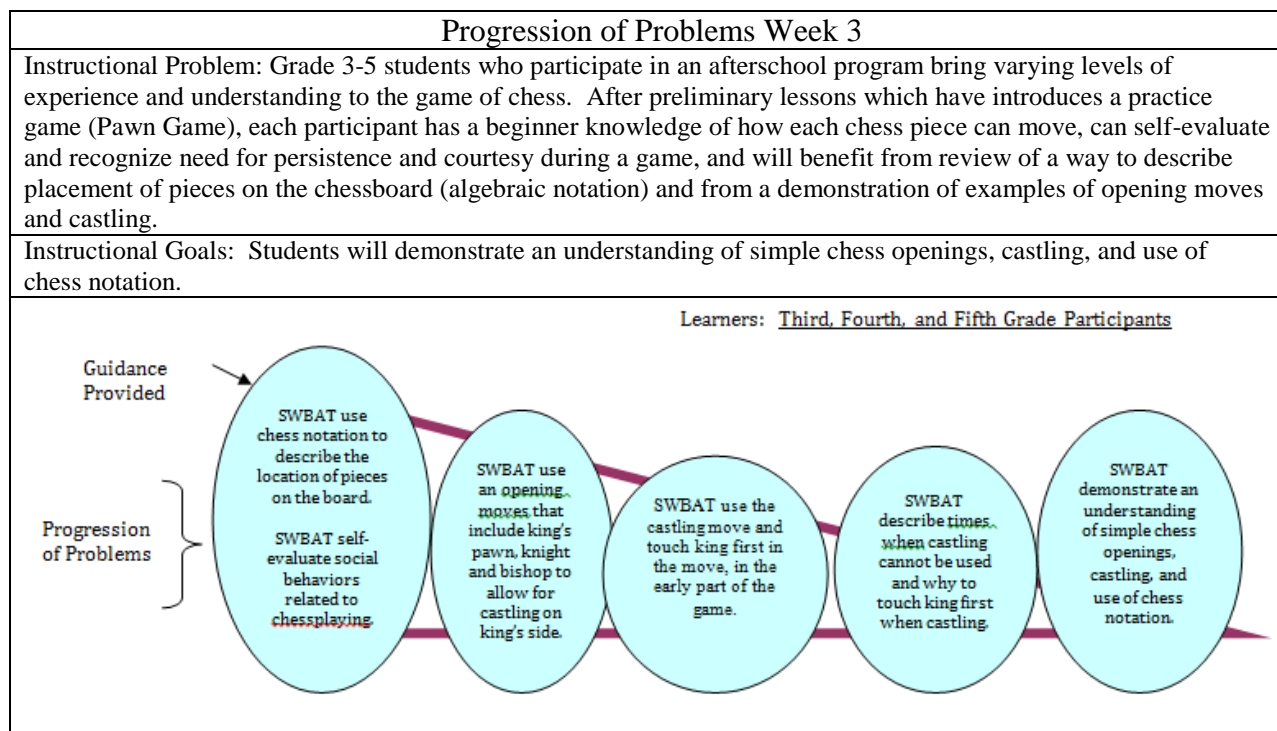| Student Name	Board set up correctly	Major pieces move correctly	Pawn moves correctly	Notices check	Castles with assistance	Checkmate observed	Plays independently
1	y	y	y	n	y	y	
2	y	y	y	n	y	y	
3							
4							

1. Affective skills: needs much attention -------------------x--can observe or play without intervention
2. Affective skills: needs much attention --------------x------can observe or play without intervention
3. Affective skills: needs much attention -------------------can observe or play without intervention

Appendix IV

Progression of Problems Week 3
Instructional Problem: Grade 3-5 students who participate in an afterschool program bring varying levels of experience and understanding to the game of chess. After preliminary lessons which have introduces a practice game (Pawn Game), each participant has a beginner knowledge of how each chess piece can move, can self-evaluate and recognize need for persistence and courtesy during a game, and will benefit from review of a way to describe placement of pieces on the chessboard (algebraic notation) and from a demonstration of examples of opening moves and castling.
Instructional Goals: Students will demonstrate an understanding of simple chess openings, castling, and use of chess notation.

Learners: Third, Fourth, and Fifth Grade Participants

Guidance Provided

Progression of Problems

SWBAT use chess notation to describe the location of pieces on the board.

SWBAT self-evaluate social behaviors related to chessplaying.

SWBAT use an opening moves that include king's pawn, knight and bishop to allow for castling on king's side.

SWBAT use the castling move and touch king first in the move, in the early part of the game.

SWBAT describe times when castling cannot be used and why to touch king first when castling.

SWBAT demonstrate an understanding of simple chess openings, castling, and use of chess notation.

Skills and Knowledge Week 3					
	Pebble 1	**Pebble 2**	**Pebble 3**	**Pebble 4**	**Pebble 5**
Skills	SWBAT use chess notation to describe the location of pieces on the board.	SWBAT use an opening moves that include king's pawn, knight and bishop to allow for castling on king's side.	SWBAT use the castling move.	SWBAT describe times when castling cannot be used and why to touch king first when castling.	Students will demonstrate an understanding of simple chess openings, castling, and use of chess notation.

Skills and Knowledge Week 3					
	Pebble 1	**Pebble 2**	**Pebble 3**	**Pebble 4**	**Pebble 5**
Skills	SWBAT use chess notation to describe the location of pieces on the board.	SWBAT use an opening moves that include king's pawn, knight and bishop to allow for castling on king's side.	SWBAT use the castling move.	SWBAT describe times when castling cannot be used and why to touch king first when castling.	Students will demonstrate an understanding of simple chess openings, castling, and use of chess notation.
Knowledge	Students describe location of pieces on the chessboard using algebraic notation Students self-evaluate and discuss strategies to increase persistence, control frustration, and act courteously Use technology to record, view and discuss behaviors	Students move pawns to allow stronger pieces to move forward. Students know that the knight can move over pawns. Students move pieces to clear the spaces between king and rook. Students can identify a series of moves that can enable the spaces between King and rook to be clear.	Students know that castling involves king and castle in one move. Students can observe and practice castling . Students know to touch the king first in this two piece move. Students are introduced to information that castling can be done on either side of the king as long as the row is clear. Student begin to understand that there are times that king and rook cannot castle.	Students can recognize times that the king and the rook cannot castle. Students know that the king cannot castle in check. Students know that king cannot castle if either the king or the rook has moved. Students can explain that in cases of "touch move" the player must be sure to touch King first for castling to happen. Students begin to understand that puzzle notation for castling move is 0-0 (king side) and 0-0-0 (queen side).	Sudents can practice opening moves that will clear the space between King and the rook. Students begin to understand the reasons for moving pieces in the opening of the game will allow stronger pieces to move out. Student can castle on the king's side. Student can identify the location of chess pieces in chess notation.