

**Information Technology Administrator's Instruction
Manual for the Personal Academic Strategies for Success
(PASS) Tool, With Subcomponent Academic Class
Composite Tool (AC²T)**

by Jim H. Hewson, Valerie J. Rice, and Petra E. Alfred

ARL-SR-276

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Army Research Laboratory

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Information Technology Administrator's Instruction Manual for the Personal Academic Strategies for Success (PASS) Tool, With Subcomponent Academic Class Composite Tool (AC²T)

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13. SUPPLEMENTARY NOTES *Petra E. Alfred relocated to Pacific Science Engineering, 9180 Brown Deer Rd., San Diego, CA				
14. ABSTRACT This report is based on a series of investigations conducted to reduce academic attrition among U.S. Army Health Care Specialist (68W) students in Advanced Individual Training (AIT), which include performance influences in technical-level health care training; focus group opinions and questionnaire responses on content and format from 68W instructors and students; peer and self-assessments from 68W students who failed and passed; and usability assessments and research evaluations of the effectiveness of a resultant tool. The Microsoft Access–based Personal Academic Strategies for Success (PASS) software tool was conceptualized and created by the U.S. Army Research Laboratory Army Medical Department Field Element to help reduce academic attrition. Students take a computerized survey and receive personalized feedback on strengths and weaknesses, along with recommendations on building strengths and mitigating weaknesses. Pertinent information was generated through evidence-based research and statistical regression modeling with data from 579 68W AIT students. The same tool contains a subfunction, the Academic Class Composite Tool (AC ² T), which provides instructors with feedback on their class as a whole. AC ² T is based on student self-assessment data and suggests how cadre can proactively intervene to enhance academic achievement. Early feedback allows students and cadre to make positive adjustments. This report delineates the material necessary for the Information Technology Administrator.				
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1. Overview

The U.S. Army Research Laboratory (ARL), Human Research and Engineering Directorate (HRED), Army Medical Department Field Element is a tenant organization to the U.S. Army Medical Department Center and School located on Ft. Sam Houston in San Antonio, TX. The Medical Education and Training Campus, a Department of Defense (DOD) integrated campus under a single university-style administration, is also located on Ft. Sam Houston. The primary missions of these two training programs are the same: to ensure the Soldiers, Sailors, and Airmen who attend health care professional or paraprofessional training are competent to do their jobs upon graduation. The cadre continues to seek innovative methods to improve training and retention of learning, and ultimately to provide qualified individuals to fill their service-specific jobs.

One area of concern is how to best structure training to address high attrition rates while maintaining the rigor necessary to ensure proficiency among graduates. The U.S. Army Health Care Specialist (also known as 68W, Combat Medic) Military Occupational Specialty (MOS), Advanced Individual Training (AIT) program is the largest Health Care MOS training program at Ft. Sam Houston. The large number of students needed, coupled with the current shortage of U.S. Army Health Care Specialists, brings attrition from the training program under particular scrutiny (figure 1). Approximately 16 classes of 400 to 450 service members per class are trained annually ($n = 6400$). With 1149 individuals on average failing to complete the program each year, the attrition rate is approximately 18%.

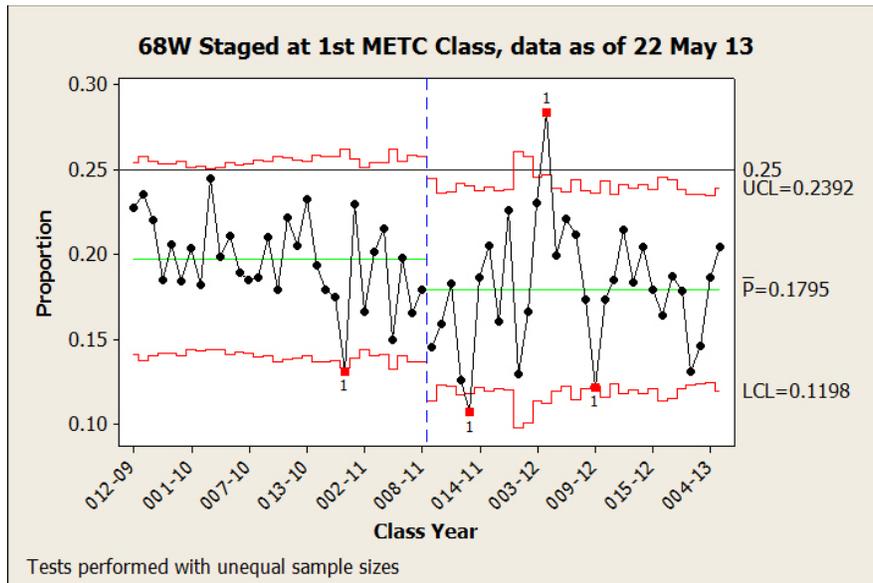


Figure 1. Attrition rates for 68W students from final quarter 2009 through third quarter 2013 (Army Medical Department Center & School internal report using data from the Army Training Requirements and Resources System [ATRRS], 2013).

Research conducted by ARL/HRED, Army Medical Department Field Element, to address the high attrition rates among Soldiers attending the 68W Healthcare Specialist MOS course at Ft. Sam Houston, TX, resulted in the development of a tool designed to provide feedback for students and cadre (DeVilbiss and Rice, 2007; DeVilbiss, Rice, Laws, and Alfred, 2010; Rice, Butler, Marra, et al., 2006; Rice and DeVilbiss, 2006; Rice, Butler and Marra, 2007; Rice, Butler, Marras, et al., 2007; Rice and Alfred, 2012; Rice, Banderet, Merullo and Boykin, 2012; Rice, Butler and Marra, 2013). The development process involved selecting questionnaires and scales that represented factors thought to be associated with performance during training within a health care field. These factors were identified by instructors and supervisors of the 68W training program during focus groups and through an extensive literature review on predicting academic performance among health care students in civilian and military settings (Rice et al., 2006). Approximately 360 questions covering a wide range of personal characteristics and constructs were selected and administered to 700 Soldier volunteers attending 68W AIT. Analyses were conducted to identify relationships between the questionnaires or scales and academic performance (pass/fail status and grade point average) during 68W AIT. The final tool includes 136 active questions and over 300 inactive questions that can be turned on to investigate other training programs.

The feedback information for both students and cadre is based on the initial research, with analysis consisting of a combination of correlations and logistic regression techniques.* Questionnaire data was found to be related to, and predictive of, academic achievement in the 68W training program. Only those questions and scales related to (and predictive of) academic achievement have been included in the Personal Academic Strategies for Success (PASS) tool (Rice, Butler, Marra, et al. 2006; DeVilbiss, Rice, Laws, and Alfred, 2010; DeVilbiss and Rice, 2007; Rice and Alfred, 2012). The factors that represent the various questions and scales were prioritized according to strength (of regression beta) and the number of times a factor appeared as significant in numerous analyses, including both regressions to predict pass/fail status and grade point average (table 1) (Rice et al., 2007; Rice and Alfred, 2012). The research identified 27 factors associated with successful 68W academic performance derived from the list in table 1.

In the final version of this tool, students answer a series of questions about their background, experiences, and how they approach events in their life. They then receive feedback about how they can best take advantage of their unique personality and background, and moderate any personal challenges that may be identified. The goal is to use the personalized feedback to make changes in their life and pass AIT. The feedback to students provides them with information that could impact their AIT performance. This portion of the tool is referred to as the PASS.

* The statistical process was as follows. First, the correlation analyses identified several correlates of academic achievement. Then, these correlates were narrowed using confirmatory factor analysis until a reasonable number of variables were selected. Next, the reduced variable list was input into logistic regression analyses until the best fit model of academic achievement predictor variables was identified. The final regression model then formed the basis for both the PASS and AC2T. This was done for both pass/fail status and for grade point average.

Table 1. Prioritized list of variables contributing to regression analyses predicting pass/fail and grade point average for students attending 68W AIT.

<ol style="list-style-type: none"> 1. Education Level 2. Study Skills 3. Hardships 4. Continuance Commitment 5. Health Status 6. Physical Fitness Prior To Enlistment 7. Interest In Course 8. Willingness To Take Course 9. Low Training Importance 10. African American 11. Self-Efficacy 12. High School Science Grades 13. Fear Of Failure 14. Avoidance Coping 15. Stress 16. Sociability 17. Smoking 	<ol style="list-style-type: none"> 18. Positive Thoughts 19. Overall Attention Deficit/Hyperactivity Disorder Symptom Score 20. Parental Marital Status – Parents Divorced 21. Home Until Enlisted 22. High School GPA 23. Oppositional Defiance Disorder Symptom Score 24. Achievement 25. English As A Second Language 26. Marital Status, self – divorced 27. Overtired 28. Prior Medical Training 29. USAR component 30. Negative Thoughts 31. Responsibility 32. Science Orientation 33. Visual-verbal learning
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The PASS program functions as a self-evaluation and feedback tool using an online platform in which students answer an array of questions. Based on their responses, students receive:

- A profile identifying individual personal characteristics (strengths and concerns).
- A qualitative narrative offering strategies to use their strengths and mitigate their concerns to facilitate academic achievement.
- Additional references for those interested in learning more about how to improve their performance based on their profile.

The chief aim of the PASS program is to provide students with feedback they can use to better understand themselves and their behavior patterns, so they may use that information to adjust their learning strategies and ultimately improve academic achievement.

The tool also provides feedback to cadre. The information included in the feedback and presentation style were developed and assessed with the 68W AIT cadre. This portion of the tool is known as the Academic Class Composite Tool (AC²T), and it is a subfunctionality of the PASS. The feedback to cadre is based on the same student self-assessment data. It provides information on the 68W training class as a whole, in terms of their strengths and weaknesses, along with suggestions on how cadre can proactively develop interventions to enhance the academic achievement of their students. This function was developed for commanders, supervisors, and academic instructors. Using the data students entered into the PASS, the AC²T provides them with:

- A composite view of the class characteristics.

- Suggestions for effective teaching strategies or interventions to assist their students based upon the class characteristics.
- Additional references for those interested in learning more about the topic areas identified.

Because the primary aim of the AC²T is to provide commanders, supervisors, and instructors with composite characteristics of a specific class of students, instructors may use this information to adjust their teaching styles to better meet the needs of a specific class of students. They may also develop interventions to assist the class, such as providing instruction on study skills or stress management.

Cadre can also elect to complete the questionnaire and receive their own profile as a student. By doing so, they would receive the same information students receive. This information could be used to help cadre identify student Soldiers with a similar profile. Given the supposition that cadre have overcome personal characteristics that may have impeded academic performance, they can then share their own strategies for success with their students.

In summary, the PASS is a self-help tool to help students pass an MOS course. The PASS is based on research with 68W Health Care Specialist AIT students to determine which personal characteristics correspond with improved grades and a better chance of passing the course.

The PASS provides students with information based on their own responses to a series of questionnaires regarding topics taken from table 1. Along with the identification of their personal characteristics, students are given strategies to help them build upon their strengths and mitigate their challenges with the goal of improving their performance during AIT.

When administering the PASS, the administrator must emphasize to students the importance of answering the questions accurately, because accurate answers will determine the most helpful feedback.

To reiterate, each student taking the PASS will receive the following feedback based on their responses:

- A profile identifying their personal characteristics (strengths and areas for improvement).
- Descriptions of each personal characteristic.
- Tips or recommendations to help improve chances of academic success.
- Additional references if they want to learn more about their personal characteristics.

Confidentiality is key. None of the student's personal information will be revealed. Only group-level data will be presented in any report published or presented to anyone's command. Instructors and administrators will be provided only group-level information.

For students to get the best use from PASS feedback, they should:

- Read the Strengths Feedback to learn how to maximize their strengths.
- Read the Improvement Areas Feedback to learn how to transform improvement areas into strengths.
- Plan a course of action by focusing on one feedback item and the associated Tips for Success at a time to build upon the strength and enhance the improvement area.
- Practice, practice, practice to best reinforce learning.
- Learn more by reading the provided additional resources to gain more self-knowledge to maximize improvements.

A. Design

PASS was designed with the researcher and student in mind. The student takes the questionnaire, and the researcher analyzes the responses.

B. Environment

1. Network – Computer Lab

PASS is run over a local area network (LAN), though only instructors are permitted to directly access the back end of PASS containing the student Personal Identifiable Information (PII) or researcher data over the LAN. Students may access internet-based applications but not the LAN itself. If the PC the students are working on has access to the internet, PASS will not affect internet access. Students do not have direct access to the PASS back end with student PII or researcher data. PASS is available on machines for student use prior to, during, and after class.

2. Topology of PASS

The PASS tool was split into two Microsoft Access 2007 files to account for data storage needs, security issues, and ease of portability. A Front End (FE) for students to log into should be located on each machine in the computer lab. Each FE should have connectivity to the Back End (BE) that stores user credentials and is located on a local machine.

3. Software

Microsoft Access 2007 was chosen because of its rich user interface and because it is a standard installation on most machines, thus avoiding licensing issues. Access data input functions are also familiar to most Windows users, such as radio buttons, check boxes, and command buttons.

4. Printing

(a) Students and Cadre

Students and cadre should be able to print from any machine in the computer lab. Current configuration requirements mandated that students be denied the printing function. The capability was turned off; however, the IT administrator has the ability to enable the feature (see section C).

(b) Researchers

Researchers should be able to print from their work stations.

C. IT Administrator's Role

1. General Functions

(a) Ensure each machine is set up correctly to include the security settings, monitor resolution, and network connectivity.

(b) Connect the FE to the BE

2. Other Documents

(a) Technical and Functional Specifications

(b) Researcher Administrator's User Manual

2. Workstation Setup Requirements

A. Machines

1. Microsoft Windows XP Operating System or higher with the latest service packs.
2. The monitor's screen resolution is set at 1280 × 1024 pixels or higher. Typical monitor should be 21-in flat screen with color quality set to the highest setting.
3. Network connectivity with a minimum of 100 Mbps.

B. Software

1. Students and Cadre

(a) Microsoft Office 2007 Professional or higher

OR

(b) Microsoft Access 2007 Runtime version or higher (a free download from MS)

2. Researcher, Admin Researcher

(a) Microsoft Office 2007 Professional or higher

The PASS tool will export results in Microsoft Excel 2007 version—previous versions are not capable of handling a questionnaire export.

IBM SPSS Statistics v16 or higher to assess the results and possibly make changes to the questionnaire. Previous versions cannot import the number of columns necessary for the questionnaire.

3. IT Administrator

(a) Microsoft Office 2007 Professional or higher.

(b) A graphics software package is desirable for graphic changes or modification if needed.

C. Front End

1. Use master FE and connect to BE
2. Copy FE to each student workstation

D. Back End

Should be located on the network with each person given enough access rights to be able to add or modify data.

3. Logging In

A. The Splash Screen (figure 2)

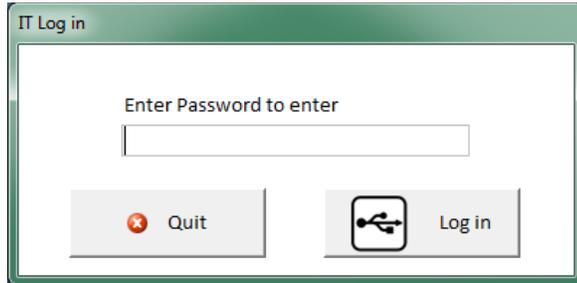
1. The  button in the upper-left corner or the “X” in the right-hand corner will close Access (and exit PASS) at any time and is available whenever a user needs to exit.
2. Click the hidden button located in the picture of the computer in the upper graphic to open the IT Log in pop-up form and close the splash screen.



Figure 2. Splash screen.

B. IT Log in

1. Enter password.
2. Quit to close the database.
3. Log in.



(a) If the password is too short, a message box will appear.



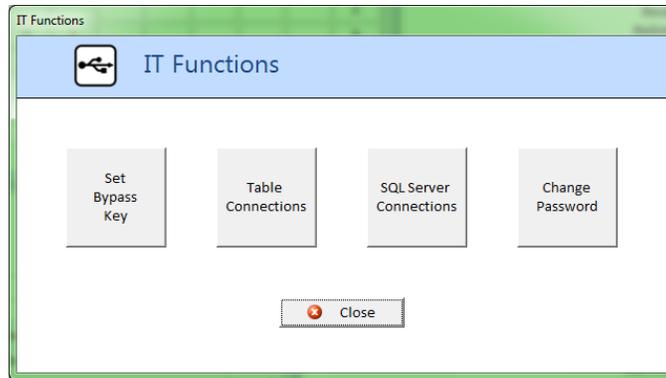
(b) If the password is incorrect, a message box will appear that states, "Not found! Please try again".



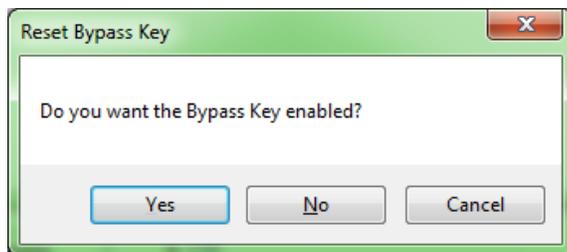
4. IT Function

A. Set Bypass Key

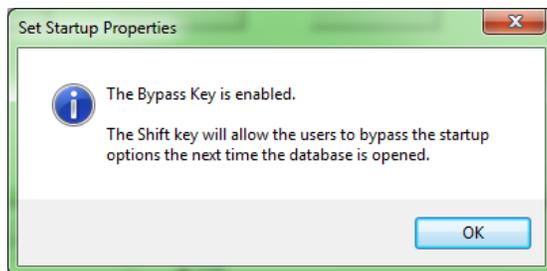
The Bypass Key is turned off by default. If the Bypass Key is turned on, then holding the "Shift" key down as Access opens will bypass all code and macros.



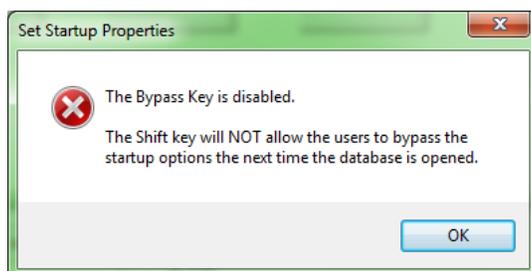
1. Click the button.



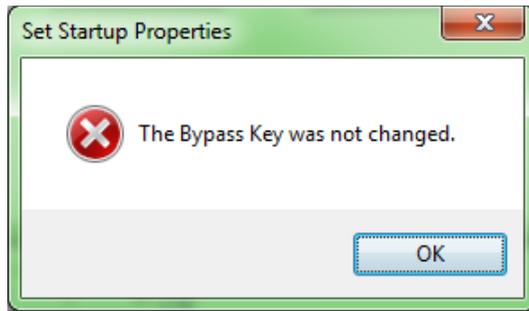
2. Yes will enable the Bypass Key.



3. No will disable the Bypass Key.



4. Cancel will return to the IT Functions Menu.



B. Table Connections (figure 3)

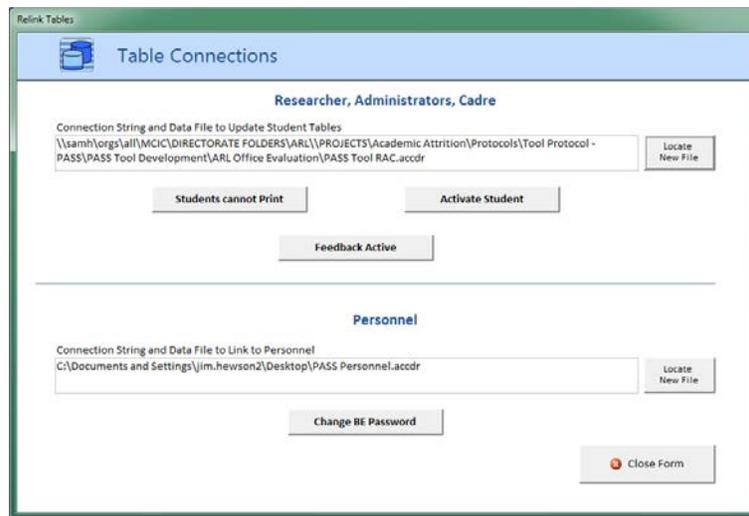


Figure 3. Table connections.

1. Researcher, Administrators, Cadre (RAC). The RAC is used by the student's file to record questionnaire results.
 - (a) Click the Locate New File button.
 - (b) A Windows dialog box will appear.
 - (c) Choose File and click Save. The location and file name will be placed into the connection string field.

Note: Make sure to use the Universal Naming Convention (UNC) and not a mapped drive. Each machine could have the location mapped differently.

2. Students cannot Print / Students can Print toggle button.
This button enables and disables student printing capability.



3. Activate Student / Student Activated toggle button.
Once the RAC is in place, a copy of the RAC is made, and this button enables the student copy. The UNC identified previously is what the student version uses to record the results.



4. Feedback Active / Questionnaire Only toggle button.
When feedback is not needed for a questionnaire, this button is used to give the “student” a questionnaire complete message instead of the results of the questionnaire with feedback.



5. Personnel file location.
The Personnel file is used to store participant information, such as Person ID and name.

- (a) Click the Locate New File button.
- (b) A windows dialog box will appear.
- (c) Choose File and click Save. The location and file name will be placed into the connection string field.

Note: Make sure to use the UNC and not a mapped drive. Each machine could have the location mapped differently.

6. Change BE Password.
Use the Change BE Password button to automate the process. If there is no password in the BE, the manual process must be used to connect the BE.

- (a) Automated process:
 - (1) If the password to the new file has changed, click the Change BE Password button.
 - a. There are restrictions on passwords that are described below.
 - b. Click Cancel or Change Password.
 - c. If there is no password to the new BE, the manual process must be used.



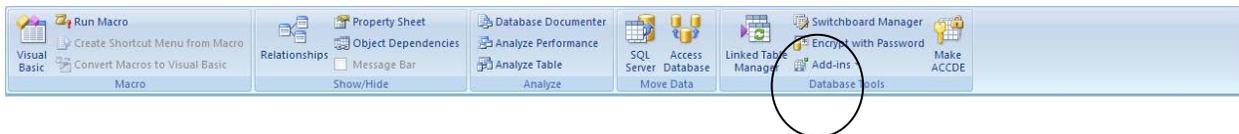
(2) Click the Link Tables button.

- a. Tables will be linked from the BE to the FE, so tables stored in the BE may be accessed from the FE.
- b. A message box will appear stating the tables were relinked.

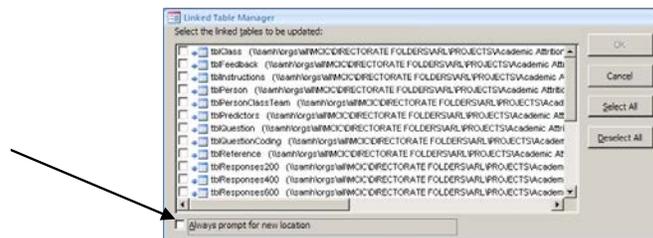


(b) Manual process:

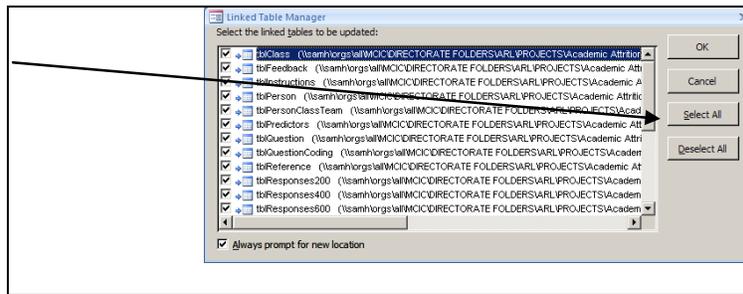
- (1) Enable Bypass Key.
- (2) Open the FE using the Bypass Key.
- (3) Open Database Tools ribbon.



- (4) Open Linked Table Manager.
- (5) Check “Always prompt for new location”.



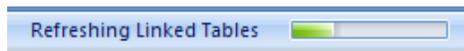
(c) Click “Select All” button.



(d) Click OK.

(e) Locate file using the UNC and not a mapped drive.

(f) Click Open. Wait for the tables to be linked; it could take a minute or two depending on the network. Watch the progress bar in the lower right-hand corner.



(g) If successful, a message box will appear. If the process is unsuccessful, a message box should appear with the problem and a suggestion on how fit it.



(h) Click OK to close the message box and then click Close on the Linked Table Manager.

C. SQL Server Connections Button

This button opens the SQL Connections form (figure 4).

Figure 4. SQL Connections.

1. SQL Server Connections
 - (a) Server Name
 - (b) Database Name
 - (c) User Name
 - (d) Password—the X’s in figure 4 are for demonstration purposes only; the actual password will be visible.
 - (e) Import Class Data—see figure 4 or required parameters.
 - (f) Select Class—see figure 4 or required parameters.
2. Activate SQL / SQL Active toggle button.

This button is used to activate the SQL import. If it is not activated; the option to use SQL import is not available on the Administrator’s form.



- Close button.

The button is used to close the SQL Server Connections form.



D. Change Password

- Type in your old password.
- Type in your new password.
- Confirm your new password.
- Click the Change Password button if you want to change your password or Cancel if you change your mind.

 A screenshot of a 'Change Password' dialog box. The title bar at the top says 'Change Password'. The main area has a blue header with the text 'Change Password'. Below the header are three text input fields labeled 'Old Password', 'New Password', and 'Confirm New Password'. At the bottom of the dialog, there are two buttons: 'Cancel' on the left and 'Change Password' on the right.

- Passwords.

(a) Passwords are encrypted and must be decrypted and re-encrypted to be stored.

(b) Passwords must have a minimum of 12 characters and must have:

- two upper case letters
- two lower case letters
- two numbers
- two special characters

!	%)	-	;	?]	{
"	&	*	.	<	@	^	
#	'	+	/	=	[_	}
\$	(,	:	>	\	`	~

(5) Space can be used in any position of the password except the last character.

(c) The following errors could be encountered:

(1) Length is incorrect.



(2) Two capital letters are needed.



(3) Two lowercase letters are needed.



(4) Two numbers are needed.



(5) Two special characters are needed.



E. Close Form

The  button is clicked to close the database.

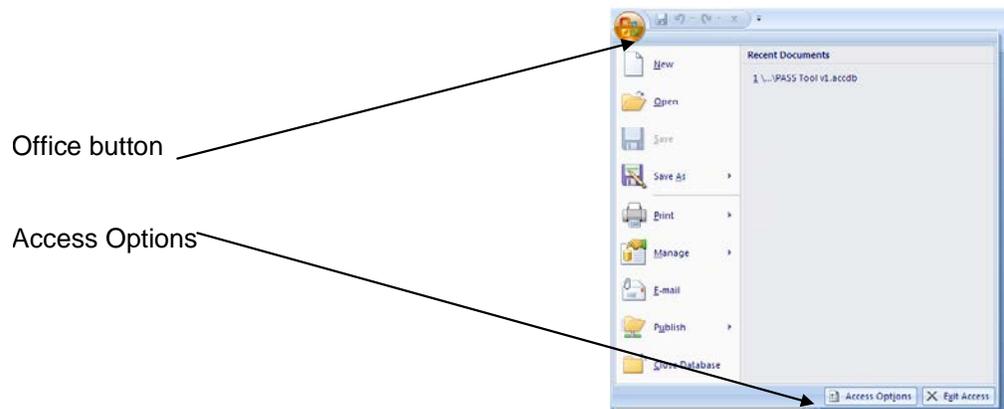
5. Miscellaneous Tasks

A. Activate (Unhide) Email Button for Students.

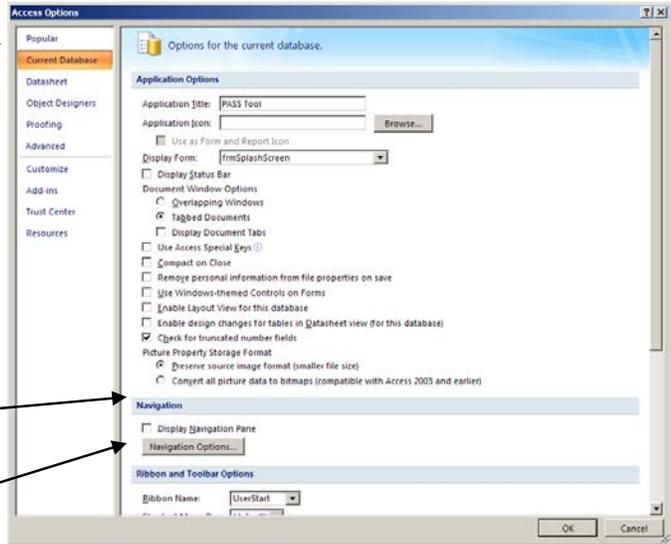
1. Enable Bypass Key.
2. Open the PASS tool using the Bypass Key.
3. Locate “frmResultsStudent” form.
4. Open in Design mode.
5. Locate the Email button (btnEmail).
6. In the properties sheet, change visible property from No to Yes.
7. Save form.
8. Close PASS tool.
9. Disable Bypass Key.

B. Add Calculation Formula.

1. Enable Bypass Key.
2. Open the PASS tool using the Bypass Key.
3. Ensure hidden objects show:

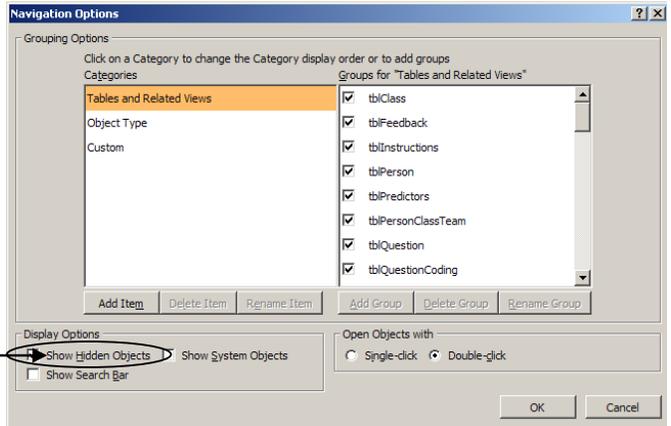


Current Database



Navigation

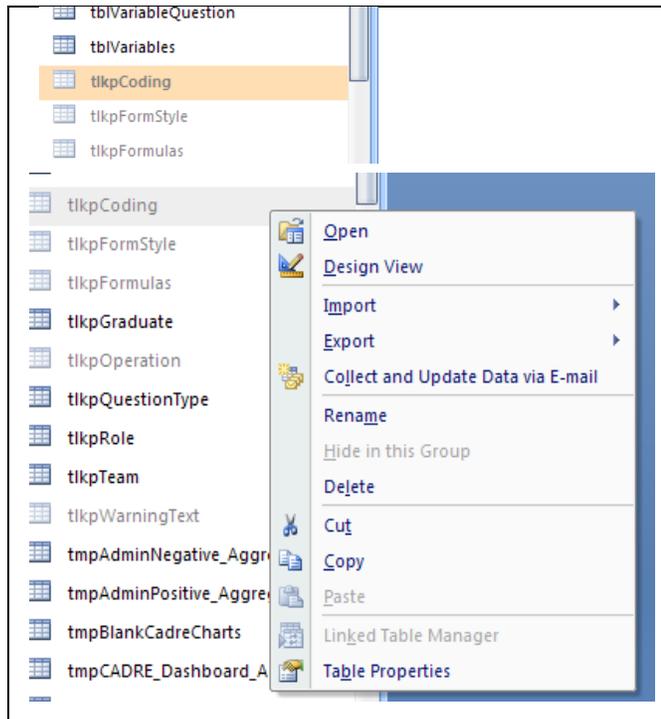
Navigation Options button



Show Hidden Objects

4. Add Formula.

- (a) Locate table: tlkpCoding
- (b) Right click on table
- (c) Open
- (d) Add Formula
- (e) Save



Note: See figure 5 for the following steps:

5. Create Formula Query.

- (a) Review current formula queries.
- (b) Create new query using math function for results.
- (c) Ensure fields are in the same order as the other Formula queries.
- (d) Test to ensure results are consistent with formula.

6. Add New Query to Union Query.

- (a) Add query to the Calculation Results union query.
- (b) Test to ensure formula is correct.

7. Test new formula with the results.

- (a) Using the Researcher's Questionnaire Verification user interface, create a questionnaire with the responses of the new formula.
- (b) Test to ensure results are as intended.

8. Disable Bypass Key.

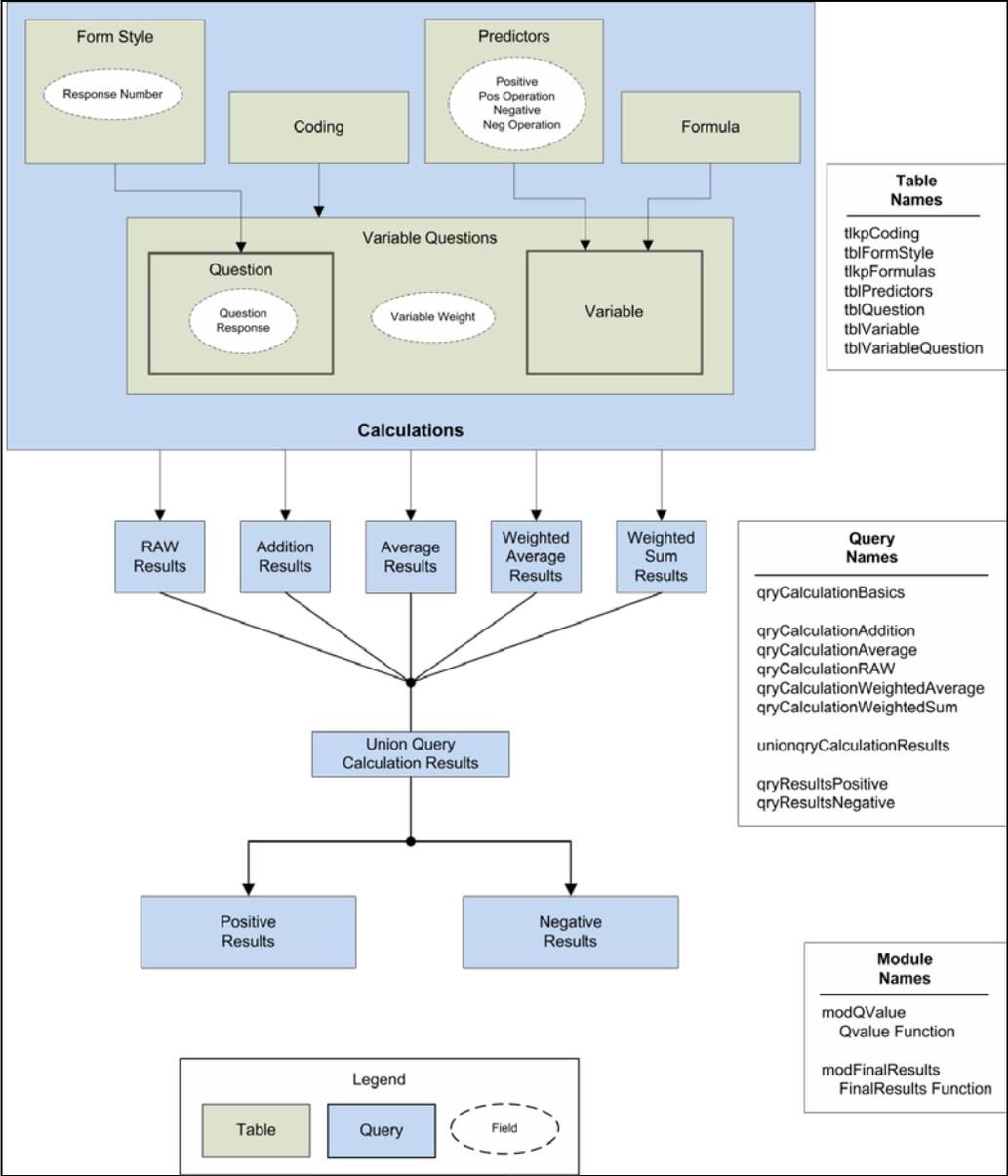


Figure 5. Formula data flow diagram.

6. Best Practices

A. Master Database File

1. Maintain original database file.

Do not change the passwords; in the event the modified Master's password is lost or forgotten, the original can be copied. Original passwords:

- (a) IT Admin: PassTool10!!
 - (b) VBA Window (Code): PASStoolAdmin
 - (c) Back End: PASStoolBE2010!!
 - (d) First Researcher Admin: SuperAdmin12%^
2. Maintain two master files.
 - (a) File one
 - (1) Modify passwords and distribute file.
 - (2) Allow researchers to change the questionnaire, etc.
 - (3) After researcher has finalized questionnaire, etc., make copy two.
 - (4) Distribute file according to usage.
 - (b) File two
 - (1) After copy one has been finalized, copy file one.
 - (2) Change the passwords back to the original.
 - (3) Keep copy in a separate location (backup).

B. First Research Admin Is IT Admin

1. This allows the IT Admin to use the same interface as the Researcher Admin.
2. Enables IT Admin to check passwords of all users and reset passwords as needed.

C. Security Issues

1. General Recommendations
 - (a) Use a hidden UNC location for the BE and all backups.

This keeps the location hidden so most users (students specifically) are unaware of where the files reside.

(b) Rename the FE extension from ACCDB to ACCDR.

The extension ACCDR designates it is a runtime file. Access runtime mode prevents users from modifying or deleting objects from the application. It also prevents users from linking to the file or importing objects (e.g., tables) from the file.

When changed, the Access icon changes from  to , indicating the file locked.

2. Back End (BE)

(a) Location

- (1) Access to the BE's location will allow it to be copied.
- (2) Keep the UNC location hidden using the "\$" in the share designation; this keeps the location hidden and is more difficult to find.

(b) Encrypt BE

- (1) Enable Bypass key.
- (2) Click on Database Tools.
- (3) Click on Encrypt with Password.



- (4) Follow the directions on the screen.
- (5) Write down the password.
- (6) Relink tables in FE.

(c) BE Copied/Linked

- (1) Encrypting the BE will ensure the person that attempts to use it will be required to supply the password.
- (2) Encrypting the BE will not allow the BE to be used without a password.
 - a. Cannot to be linked.

- b. Cannot copy a table or any object.
 - c. Cannot open file.
- 3. Front End (FE)
 - (a) Enabled Bypass Key
 - (1) Does not allow a user to bypass the Autoexec macro.
 - (2) Ensures Autoexec macro is used and forces the user to use the login screen.
 - (b) Connect BE tables through FE
 - (1) New empty database.
 - a. Linking to the tables cannot be done.
 - b. Importing tables – user can only import the “link” to the tables.
 - (i) Can be directly opened if the user is authorized to access the location of the BE.
 - (ii) Cannot be used if the file has been moved from the LAN.
 - (2) All tables have been hidden in the BE.
 - a. Typically, hidden objects cannot be seen.
 - b. Standard setup for users is to ensure hidden objects do not show using the Navigation Options.
 - (3) Personal Identifiable Information (PII)
 - a. Name and Rank are visible.
 - b. DOB is not collected or stored.
 - c. SSN or password.
 - (i) Are encrypted
 - (ii) Cannot be decrypted without code
 - (iii) Code functions cannot be imported into a new file
 - (c) Ensure extension has been changed from ACCDB to ACCDR (see above).
- 4. Single File
 - (a) Enabled Bypass Key
 - (1) Does not allow a user to bypass the Autoexec macro.

- (2) Ensures Autoexec macro is used and forces the user to use the login screen.
 - (3) Even if the extension was changed to ACCDR, the typical user still cannot access the objects (e.g., tables, code).
- (b) Ensure extension has been changed from ACCDB to ACCDR (see above).

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