

FIVE-YEAR EVALUATION
INDUSTRIAL ARTS/TECHNOLOGY DEPARTMENT
RIDGE HIGH SCHOOL
GRADES 7-12

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Supervisor
Christine High

Teachers
Chris Banta
Ron Kyser
Ed Poandl
Steven Richards
William Roth

Parent
Blaese Romano

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Review of Previous Five-Year Evaluation

This is the first time that a Five-Year Evaluation has been done for the Industrial Arts/Technology Department. The most recent evaluation was the Middle States Report, done in 1997. In that report the department had two full time instructors. The department offerings consisted of traditional technical drawing classes, several computer-aided drawing and design courses, two semester courses in robotics and a four-year program in woodworking.

The Middle States Committee commended the school for:

- making classrooms available throughout the day for students to do additional work or get tutorial assistance
- having instructors who maintain a working portfolio of each student's class work and projects
- the Robotics One and Two courses which provided a unique program for students of all academic capabilities
- maintaining a conventional woodworking program for students with interest in that area.

The Middle States Committee recommended that:

Additional technology offerings be developed and implemented to meet the needs of a broader segment of the student population

The district along with the technology department should incorporate partnerships with community resources such as AT&T

The technology department should receive additional software and hardware to accommodate existing class sizes

Display work in a communal area of the building to promote enrollment of both the male and female school population.

Review of Current Program

Since 1997, when the report was provided, the school population has grown. There are now three full-time teachers who are each teaching a 6th (additional) duty in order to meet the enrollment needs, and the computer lab and wood shop are used every period of the day. The course offerings are essentially the same. There are just additional sections.

The factors for which the program was commended are still in place. The rooms are available throughout the day, depending on the needs of the students and the availability of space in the rooms. The rooms have classes assigned during every period, but if there is equipment open for the student who wishes to put in additional time, he/she is welcomed in. Teachers still maintain portfolios of their students' work. The Robotics classes are still being offered, as is the conventional woodshop courses.

While there has been discussion about the implementation of additional technology offerings, we have been limited by our resources (computers and lab space) and staff that is trained to teach the additional courses. The Television Production Course has been moved from the Art Department to the Industrial Arts/Technology Education Department. Through this course there has been an alliance formed with the community. The TV course, as it expands, will provide the Local Access Cable Channel programming which will reflect both the school and community interests and activities.

In regard to forming partnerships with community resources such as AT&T, it has been found to be unreceptive to our overtures.

Since the last Middle States Report the computer lab was moved into a new room and some new hardware and software was purchased.

New display boards have been installed throughout the building. The 2 dimensional work primarily is still being displayed in the Industrial Arts area. Occasional displays, including projects from the woods shop, are presented in the main lobby.

Course Offerings

William Annin Middle School

7 th Grade	Technology Education I
8 th Grade	Introduction to Technical Theater
	Robotics
	Technology Education II
	Woodworking
	Advanced Woodworking

Ridge High School

Mechanical Drawing/CAD
Machine Drawing/CAD
Industrial Design
Architecture
Architectural Rendering
Advanced CAD I & II Architecture
Advanced CAD I & II Machine
Industrial Robotics I & II
Woods I, II, III and IV
Television Production I and II

Instructional Strategies

Students are continually **Identifying Similarities and Differences**. During the process of production, or drawing, there is a constant analysis going on, one of analyzing parts of a work and comparing and contrasting. In the manipulation of the medium there is an analysis of the medium and how it is working, comparing and contrasting one area against another, judging the similarities and differences. Judgments and decisions continually are made about actions to take, plans to pursue or alter. In Robotics, students make observations, judgments, and change plotted points, then compare and contrast the performance of their armature. They go through that process again and again.

Summarizing and Note Taking are strategies utilized during the presentation/demonstration/motivational phases of a new assignment. Teachers present short lectures, and encourage class discussion. Students are asked to summarize a concept presented, to review the steps in a procedure demonstrated, react to or consider an idea or experience to which they are exposed. Teachers present short lectures, lead class discussions, and require that students take notes to use as a reference in working through an assignment or process.

Teachers are constantly Reinforcing Effort and Providing Recognition to their students. Student work is displayed in the 600 wing hallway all year, and periodically in the main lobby.

Homework is not formally given in most classes, but students are encouraged to allow their minds to wander, to see things in their environment and relate those things to the work they are doing. So, students are encouraged to take their thinking about industrial arts/technology education outside the lab or shop, and come back with ideas.

The technical drawing and woods courses all deal with visualizing. In the first area students are producing three dimensional space and objects on a two-dimensional plane, and in the second the students are producing three-dimensional objects. So it does not require a big stretch for teachers to include **Nonlinguistic Representations** in the lab and shop strategies. Teachers use books, magazines, simulations, models and any visual aides available to stimulate student thinking and broaden their abilities to think three dimensionally.

For every new project that is presented teachers practice **Setting Objectives and Providing Feedback**. Objectives are identified for the students and clearly communicated. Instruction is provided to expand the students' knowledge and thinking opportunities, assignments given. Assessments are done on a continual basis, both individually by the students and teachers, and then by the teachers and students together. Evaluations are provided at the end of each assignment. Both the teachers and the students do these. Students are encouraged to make their thinking process ongoing. Tests and quizzes are given in the technical drawing and CAD classes. Students are sometimes asked to work in small groups and they give presentations of their work. Peer teaching is

a very useful process that requires that students identify objectives and present information to other students. Their feedback can therefore come from observing other students who have benefited by their instruction. Technical Report Writing requires students to analyze their work and put it into very accurate and precise wording. They are given opportunities for Guided Reading, to independently get direction from written documents. The projects ultimately are all Hands-on Projects, and they are frequently required to provide documentation of their progress.

Particularly in Robotics, students **Generate and Test Hypotheses**. They use these strategies in plotting their programs. And in the technical drawing and CAD classes students also have to sometimes work their ideas out on paper. So they get their ideas, then begin to sketch them out to see how they will work. This is done sometimes through worksheets.

When new learning experiences are presented to students they are given **Cues**, asked **Questions** and provided with **Advance Organizers**. New ideas are presented within contexts so that the students can relate new learning to past learning. Information is presented in structured format, not as random facts.

Assessment and Evaluation

Several of the strategies for assessment are being used by all of the teachers in all of the classes in the Industrial Arts/Technology Education Department. These are: verbal questioning and discussion, observation of guided practice, work-in-progress critiques and end-of-project critiques. Quizzes and other forms of written responses are used more in the drafting, technical drawing and Robotics classes.

Teachers check students' progress daily, but not necessarily every student. Every student has his/her work reviewed and discussed at least twice a week. The ability of the teacher to get around to every student during a class period is dependent on the course and the number of students in the classes.

The following criteria are used to evaluate completed assignments:

- Effort is evident in the work as well as demonstrated in the process
- Following directions
- Craftsmanship
- Understanding of project objectives

In the majority of classes at Ridge, a final review is used to complete all lessons. There are final exams given in the Mechanical Drawing, Architectural Rendering and Machine Drawing classes. Other classes have portfolio reviews.

At the Middle School, tests are given at the end of each unit and a final during a regular class period at the end of the semester. Rubrics are used to establish standards of performance. Progress grades are given, depending on the class, daily, weekly or biweekly.

Some classes use documents that allow students to participate in their own project evaluation. These documents, which are tailored to meet the needs of specific courses, require students to take an objective look at their work, and reflect on the process and products.

New Jersey Cross-Content Workplace Readiness Standards

Cross-Content Workplace Readiness Standards are required to be addressed by all the various curricular areas. Industrial Arts/Technology Education is no exception, and they are easily incorporated into course objectives and project assignments.

There are five Cross-Content Workplace Readiness Standards. Each standard is addressed in Industrial Arts/Technology Education, but to greater or lesser degrees. For example, the fifth standard deals with safety. Safety is of much greater concern in some courses than it is in others. Career awareness is more relevant on the high school level than in the elementary or middle schools.

The first standard is concerned with developing **career planning and workplace readiness skills**. The strengths of the Industrial Arts/Technology Education in this area are in developing in the students the ability to:

- 1.1 Demonstrate employability skills and work habits, such as work ethic, dependability, promptness, and getting along with others, needed to get and keep a job.
- 1.2 Describe the importance of personal skills and attitudes to job success.
- 1.3 Identify career interests, abilities, and skills.
- 1.5 Identify skills that are transferable from one occupation to another.
- 1.7 Describe the importance of academic and occupational skills to achievement in the work world.
- 1.9 Identify job openings.

The second Standard states that all students will **use information, technology and other tools**. The strengths of the Ridge Art Department in this area are in developing in the students the ability to:

- 2.1 Understand how technological systems function.
- 2.2 Select appropriate tools and technology for specific activities.
- 2.7 Use technology and other tools to solve problems, collect data, and make decisions.
- 2.8 Use technology and other tools, including word-processing, spreadsheets, presentation programs, and print or graphic utilities, to produce products.
- 2.9 Use technology to present designs and results of investigations.
- 2.10 Discuss problems related to the increasing use of technologies.

The third Standard states that all students will use **critical thinking, decision making and problem solving skills**. The strengths of the Ridge Art Department in this area are in developing in students the ability to:

- 3.1 Recognize and define a problem, or clarify decisions to be made.
- 3.2 Use models, relationships, and observations to clarify problems and potential solutions.
- 3.3 Formulate questions and hypotheses.
- 3.4 Identify and access resources, sources of information, and services in the school and the community.
- 3.5 Use the library media center as a critical resource for inquiry and assessment of print and non-print materials.
- 3.6 Plan experiments.
- 3.7 Conduct systematic observations.
- 3.8 Organize, synthesize, and evaluate information for appropriateness and completeness.
- 3.9 Identify patterns and investigate relationships.
- 3.10 Monitor and validate their own thinking.
- 3.11 Identify and evaluate the validity of alternative solutions.
- 3.12 Interpret and analyze data to draw conclusions.
- 3.13 Select and apply appropriate solutions to problem-solving and decision-making situations.
- 3.14 Evaluate the effectiveness of various solutions.
- 3.15 Apply problem-solving skills to original and creative/design projects.

The fourth Standard states that all students will demonstrate **self-management skills**. The strengths of the Ridge Art Department in this area are in developing in students the ability to:

- 4.1 Set short and long term goals.
- 4.2 Work cooperatively with others to accomplish a task.
- 4.3 Evaluate their own actions and accomplishments.
- 4.4 Describe constructive responses to criticism.
- 4.5 Provide constructive criticism to others.
- 4.6 Describe actions that demonstrate respect for people of different races, ages, religions, ethnicity and gender.
- 4.7 Describe the roles people play in groups.
- 4.8 Demonstrate refusal skills.
- 4.9 Use time efficiently and effectively.
- 4.10 Apply study skills to expand their own knowledge and skills.
- 4.11 Describe how ability, effort, and achievement are interrelated.

The fifth Standard states that all students will apply safety principles. The strengths of the Ridge Art Department in this area are in developing in students the ability to:

- 5.1 Explain how common injuries can be prevented.
- 5.2 Develop and evaluate an injury prevention program.
- 5.3 Demonstrate principles of safe physical movement.
- 5.4 Demonstrate safe use of tools and equipment.
- 5.5 Identify and demonstrate the use of recommended safety and protective devices.
- 5.6 Identify common hazards and describe methods to correct them.
- 5.7 Identify and follow safety procedures for laboratory and other hands-on experiences.
- 5.8 Discuss rules and laws designed to promote safety and health, and their rationale.
- 5.9 Describe and demonstrate procedures for basic first aid and safety precautions.

Interdisciplinary Opportunities

The items we offer at Ridge as interdisciplinary components are as follows:

Technical Report Writing- Students in technology related courses are required to submit a technical report on material of their choosing. These reports follow a specific format, which requires good written expression, grammar, spelling, and technical report writing skills. These papers include a summary of material used as a resource, an objective reaction to the material and the ability to relate it to concepts, skills and projects worked on in class.

Related math instruction- All applied arts and technology courses require the use of basic mathematics which includes the use of addition, subtraction, multiplication and division of whole numbers, decimals and fractions. In addition students are required to use both standard and metric measurements. In technology courses on more advanced projects students at times will be required to use geometric, algebraic and trigonometric solutions to design problems.

Historical background instruction-Students in applied arts and technology courses are afforded ample historical instruction designed to impart an understanding and importance of the subject matter and skills they will be learning about. Students learn sequence and evolution of these skills from the beginnings of human development through the great civilizations, industrial revolution and right up to modern times. Historical background is an excellent way to develop and motivate interest in the material to be presented in applied and technology courses.

Science as it relates to design-Science is an integral part to the solution of most design problems in the technology courses. Students must be able to relate science material and facts in completion of many of their design problems. In our advanced courses we teach students to utilize the scientific method of design. This process teaches students to utilize proven principles of science coupled with empirical data in solution to their design problems.

Cultural Diversity/Multiculturalism

We prefer to consider this area as gender inclusion. All members of this department agree that making all Industrial Arts and Technology courses open to both genders is essential in this modern society. We all promote and foster this by communicating this on a regular basis to administration, counselors, parents and students in whatever forum and/or media at our disposal. We also have shop and labs that are gender friendly. The Industrial Arts and Technology knowledge and skills offered in all our courses do and will equip our students to be successful citizens and professionals now and in the future.

Different cultures are studied at least in a general way through the study of furniture styles from various countries. In Technical Theatre students study the origins of how things are done from a variety of countries and historical periods. Spanish, French and American architecture are reviewed.

Types and sources of wood are covered, mentioning for example that mahogany comes from the rainforest. But only 10% of the wood that is cut down is for use of the wood as a product. The rest of the cutting and clearing is for land use and the wood cut down is wasted.

Technology/Facilities/Program

Ridge

Room 623, the CAD/Robotics Lab.

There are 20 CAD work stations with both manual and computer capabilities for drafting. Industrial quality software for both computer engineering and architecture are available. There are five permanent robotics stations with robotic simulation software and industrial quality robotic arm trainers with appropriate programming software. Peripheral devices available are slides carousels, gravity feeders, circuit input control devices, and conveyors.

Wood shop

The woodshop is self contained (including storage for materials and projects), spray room, a full range of hand tools, five working bench stations, radial arm saw, panel saw, drill press, shaper, three lathes, oscillating spindle sander, stationary belt sander, surface planer, jointer, table saw, routers, and power sanders, power drills, and biscuit joiner.

Ventilation is poor. A dust collection system is in place but the room still has dust in the air. The dust collection system does a fair job of removing the sawdust and wood chips at individual machines. However, the design of the system's function is limited, therefore most of the dust that is generated by portable electric sanders and hand sanding is left in the air.

Television Studio

Within the Ridge High School Television Studio there are numerous pieces of equipment. The studio is equipped with 8 camcorders used for field production. The camcorders are separated by model numbers, with 5 Panasonic AG-196 camcorders, and 4 Panasonic AG-456 Super VHS camcorders. The differences between the cameras include the capability for the 456 model to handle a higher quality tape. The 456 also has an internal speaker that allows for the cameraperson to hear the incoming sound. All cameras have batteries and AC adapters with the appropriate cables.

We also are equipped with 4 Panasonic AG-A96 linear edit machines, with AG-1980 decks. Each machine has 2 monitors hooked to it, and one machine is equipped with a WJMX video mixer and character generator.

Other equipment contained within the studio includes 2 large Hitachi studio cameras. These cameras are linked to the production switcher, and all equipment is currently working intermittently. There is a smaller Panasonic camera that is also hooked into the system. In addition to the switcher, there is an audio board and a computer that was at one time used as a character generator. There is also an intercom system that has been dismantled for use with a makeshift mobile production unit. The intercom system is operating at about 80% at the current time.

The district's Channel 71 is hubbed in the Media Center, and is equipped with three decks and a Leightronix scheduling mechanism. This machine allows us to

program for tape playback and cablecast without having someone sit in front of the decks all night. The tape can playback multiple times, since the Leightronix can also rewind the tapes.

The newest additions to the studio are 3 Dell Optiplex Computers, each capable of editing video. The computers will each soon be equipped with Adobe Premiere 6.0 editing software and a Dazzle DV Bridge. The Dazzle allows for the analog video that is shot with our equipment to be transferred to a modified digital video format.

The equipment makes us capable right now of doing many productions in the field, and we have done quite a few programs outside of the classroom. The equipment we currently own, though, only allows for single-camera productions in the field. The studio equipment is not currently reliable enough to allow us to do sit-down interviews in the studio.

The facility itself is made of 4 rooms. The large classroom at one time was the chorus room, and has a 3-level riser auditorium style seating. A smaller room acts as the control room, and an even smaller one contains the video shading equipment. A long, narrow room in the back corner houses the linear editing facilities.

The proposal made to the Superintendent this year included a plan for technology and equipment upgrade in the studio. Pending budget approval, we will add mini-dv camcorders in the 2002-2003 school year, which will provide us with a clearer picture coming off the camera and less generational quality loss. The digital format will also give us more options for editing. With the cameras and the change in tape format, we also want to add new mini-dv and SVHS decks for playback and some dubbing and recording. These decks will be hooked to computers, as well as to the Leightronix mechanism in the library to provide playback capability in either format.

A necessary step in upgrading our production is not only the change-over to a digital video format, but also needs to include moving the station's hub from the Media Center to the Television Studio. This would allow for easier programming, and also provide us with the option of possibly doing live programming from time to time.

The studio would also benefit from the addition of a new video and audio mixer, the WJMX-50, which would allow for multi-camera mobile production. With the cameras hooked into the WJMX, and audio run through a small Mackie audio board using either house audio or new wireless microphones, the picture and sound quality will be hard to beat.

Wm. Annin

Room 108, the Woodshop

The wood shop is well supplied with a full lineup of hand tools, various portable power tools, and the necessary stationary power tools. Dust control is very good with a dust collection system and the dust filtration system, which is suspended from the ceiling. Maintenance is done by the teachers and by Aramark.

Room 104 Technology Lab

There are 20 computers with basic CAD and basic robotics software, and robotics kits, Lego Dacta (simple machine kits).

Room 106 106A

Some periods of the day rooms are exchanged in order to accommodate computer needs. The art rooms are used occasionally by transporting equipment on a cart (drafting, electrical, stage/lighting). At this time the exchanging of rooms is only necessary for about three periods a day. 106A is a small room that opens to rooms 108 and 106. In this room there are three computers with CAD software.

The technical theatre class is scheduled in an art room and is taught alternately there and on the stage.

The New Jersey Educational Technology Goals

The following New Jersey Educational Technology Goals are being addressed:

Goal 1 “Students will attain the educational technology and information literacy skills that will assist them in achieving the Core Curriculum Content Standards and to succeed in the workplace of the 21st century.”

Students are using technology in the all of the Technology Education classes, and some of the Industrial Arts classes.

Goal 2 “Educators will attain the skills and knowledge necessary to effectively use educational technology to assist students to achieve the Core Curriculum content Standards.”

Staff College and Online Courses are available to all teachers to help them attain at a minimum, intermediate proficiency levels in utilizing education technology to enhance student achievement.

Goal 3: Students, teachers and administrators have access to technology in all learning environments, including classrooms, schools, and other educational settings such as community centers.”

All teachers have access to computers and software applications that provide opportunities for “...authentic, student-centered, project-based learning.”

All teachers “...have access to e-mail and other interactive tools to communicate with parents, students and other educators.”

Enrichment/Remediation/Acceleration

The Industrial Arts/Technology Education Computer Lab at Ridge is open all during the day, and frequently after school. Students are encouraged to come in to make up work, to help them keep up with their work, or for extra practice for work in their courses.

Due to the nature of Industrial Arts/Technology Education classes, students are always able to work at their own pace, whether that be more slowly than the average student, or more rapidly. With the student/teacher ratio as it is the teachers are able to move around and work individually with the students, providing remediation or acceleration, as they are appropriate.

For remediation students can arrange for additional time to complete projects. Teachers do not adhere strictly to the tutorial periods. They are willing to have students come in during almost any period that is convenient both to the student and the teacher. After school time is also readily available by appointment. Written instructions are provided on the board, worksheets or handouts. Verbal instructions and visual aides are provided as well as demonstration.

Acceleration is offered as extra-credit and additional projects, but mainly by pushing the higher performing student to increased levels of performance. Teachers challenge students by discussing more complex ideas and concepts, requiring more skilled use of materials, selecting more sophisticated subject matter, and requiring more sophisticated critiquing. They are challenged to see more complex relationships between ideas, to communicate them in their work, and to identify them in the work of others.

Staff Development Activities

The Ridge High School Industrial Arts/Technology Education teachers have participated in both mandatory and extracurricular activities that support their professional development.

Those activities include:

- Staff College
- Professional Days- observing other schools
- Workshops- relating to art
- Evaluation and improvement of curriculum and facilities
- Commercial work using their skills outside of school
- Read periodicals/magazines

The Industrial Arts/Technology Education teachers at in Bernards Township are constantly reflecting on the curriculum, the program offered and the students. They look for ways to enhance the department.

Industrial Arts/Technology Education teachers are somewhat limited in the training they can take for reimbursement by the Board of Education. It is not uncommon for a teacher to want to take basic level courses in disciplines such as CAD. These courses are only provided in colleges on the undergraduate level. As a matter of fact, there are no colleges in this area that provide graduate level programs in Industrial Arts/Technology Education. Since the teachers' contract says it only will reimburse teachers for graduate level courses, these teachers are discouraged from taking courses that would enhance their abilities to present the curriculum or develop and expand the program.

Curricular and Co-Curricular Offerings

At William Annin Co-Curricular Activities revolve around the spring musical. They include the Technical Crews: lighting, sound, set design and construction, painting, costume/makeup. The Business crews produce the playbill, posters and provide ushers.

Ridge High School does not offer any Co-Curricular offerings.

Comparison of I Factor School

Programs of Study were collected for a variety of I Factor school districts. Those districts included Governor Livingston, Mendham, Chatham, Holmdel, Madison, Summit and New Providence. Our course offerings compare quite favorably to the other school districts, both in breadth and depth. Next to Livingston, Bernards Township offers the largest number of courses. In some instances there are differences between semesters vs. full year courses. The courses we offer provide exposure to Technology Education, Woods, Technical Fabrications, Technical theatre, Robotics, Mechanical Drawing/CAD (Architecture and Machine), Industrial Design, and Television Production.

Those areas that are not addressed in our Program of Studies, but are offered in other schools are Technical Drawing, Manufacturing, Metals, Transportation, Graphics, Small Engines, Automobile/Home Maintenance, Electronics, Photography, Fashion, and Interior Decorating.

The Technology Education courses we offer are in the middle school. We do not at this time continue those offerings at the high school. It would be possible and advisable to provide opportunities in the high school in the areas of manufacturing, transportation, and construction. That could be accomplished by expanding the Technology Education courses to the high school. Though there are students at the high school who would benefit by experiences in Auto Repair and/or Maintenance, there is not a sufficient number at this time, or anticipated to justify the cost. Those experiences are offered at the Somerset County Vocational School. We do offer Photography through the Art Department. Though the approach is different depending on the department, the processes are similar. Fashion Design and Interior Decorating would probably be offered through the Home Economics Department, which does not exist at the high school at this time.

Analysis of Student Survey Results

A survey was given to eighth graders at William Annin and juniors and seniors at Ridge High School. These groups were selected because for their respective levels they have been they are in the best positions to know something about the course offerings and to have had the most extensive personal experience with those offerings.

At William Annin the survey indicated that students ...

Agree that Industrial Arts/Technology Education courses at William Annin challenge their intellectual curiosity.

Agree that Industrial Arts/Technology Education classes help to prepare them to become more informed citizens.

Strongly agree that the course requirements are consistent with what is expected

Are neutral as to whether the Industrial Arts/Technology Education courses offered at William Annin will help them perform more successfully both in the work place and college.

Are neutral as to whether the Industrial Arts/Technology Education courses seem to cover the same content.

Strongly disagree that homework and project work were more demanding than had been expected in Industrial Arts/Technology Education classes.

Strongly agree as to whether Industrial Arts/Technology Education helps them to be more technologically aware and proficient.

Are neutral as to whether there is a need for more Industrial Arts/Technology Education courses to be offered at William Annin.

Agree that connections are made between Industrial Arts/Technology Education and other disciplines in a meaningful manner

Are neutral as to whether current events are integrated into the classroom when appropriate

Disagree to strongly disagree that Industrial Arts/Technology Education courses enhance their writing abilities

Agree that Industrial Arts/Technology Education courses at William Annin are helping to prepare them to work in cooperative settings.

Strongly agree that they would rate their Industrial Arts/Technology Education experience at William Annin as excellent.

At Ridge the survey indicated that students ...

Agree that Industrial Arts/Technology Education courses at Ridge challenge their intellectual curiosity.

Are neutral as to whether Industrial Arts/Technology Education classes help to prepare them to become more informed citizens.

Strongly agree that the course requirements are consistent with what is expected

Strongly agree that Industrial Arts/Technology Education courses offered at Ridge will help them perform more successfully both in the work place and college.

Are neutral as to whether the Industrial Arts/Technology Education courses seem to cover the same content.

Agree that homework and project work are more demanding than had been expected in Industrial Arts/Technology Education classes.

Strongly agree to agree that Industrial Arts/Technology Education helps them to be more technologically aware and proficient.

Strongly agree that there is a need for more Industrial Arts/Technology Education courses to be offered at Ridge.

Are neutral as to whether connections are made between Industrial Arts/Technology Education and other disciplines in a meaningful manner

Agree that current events are integrated into the classroom when appropriate

Disagree that Industrial Arts/Technology Education courses enhance their writing abilities

Agree that Industrial Arts/Technology Education courses at Ridge are helping to prepare them to work in cooperative settings.

Strongly agree that they would rate their Industrial Arts/Technology Education experience at Ridge as excellent.

Philosophy

Technology Education is an essential component of the modern comprehensive K-12 education. Technology is defined as “how humans apply knowledge and resources to solve problems, modify the world, and extend their capabilities.” The study of technology education is built on this foundation. An effective technology education program offers students the opportunity to apply learned Technical knowledge as well as knowledge from other content areas to actively solve problems, participate in design activities, test and evaluate solutions, and study the designed world as well as the history and impacts of technology.

It is important to note that although technology education incorporates the use of computers, it is not computer education, but rather a program of study about technology in a broader context. Technology Education is a field of study involving the application of learned principles to specific, tangible situations, with the ultimate goal of producing a technologically literate student. The comprehensive Tech. Ed. program is typically broken down into four areas, or systems: Communication, Construction, Manufacturing, and Transportation. With an emphasis on design, problem solving, and critical thinking, students in the program become involved in the process from a hands-on perspective. Technology education lends itself to a variety of teaching techniques. Students participate in action-based activities on an individual, small group, and a large group basis with the intended outcome of the learner being able to work cooperatively or competitively in a variety of situations and settings.

Beginning at the middle school level, all students participate in multiple Technology Education courses, which serve to introduce the concepts of technology, design, and problem solving. Students at this level develop a basic understanding of the components or systems of Tech. Ed. and begin to develop confidence in their respective ability to work safely with tools, equipment, and materials. These introductory courses also give the students the opportunity to recognize their own skills and interests. By the eighth grade, students begin to participate in their own choice of classes from a wide variety of available elective courses and programs. These electives allow students to build on what was previously learned and allow interested students to study technology in greater depth in their own areas of interest. The availability of elective courses continues at the high school level with an even wider range of content areas for the learner to explore. The curriculum is geared towards all students, whether they are college preparatory, in preparation for technical school, or intent on pursuing a vocation. The curriculum also adds an avocational component to the student’s repertoire.

Throughout the student’s educational career, Technology Education provides the opportunity to develop basic technical skills and understanding and to expand on this knowledge to become a well-rounded, technologically literate young adult. Whether seeking post-secondary education, or entry level employment, the Technology Education program provides the student with the tools needed to be an effective problem solver, well versed in the design, application, outcomes, and impacts of technological systems.

Program Goals

The goals of Industrial Arts/Technology Education are as follows:

To help all students make informed decisions as consumers of technology in all aspects of their lives.

To develop within students an understanding of the impact and consequences of technology on their lives.

To have students apply creative problem solving techniques to finding the solution of technical problems.

To have the students apply the concepts of mathematics, science, social studies, language arts, humanities and the arts in the context of technology.

To engage students from all sectors of the student population in meaningful first hand experiences in technology.

To use technology education as a catalyst for an interdisciplinary approach to general education.

To aid all students to begin making informed career choices.

To develop an attitude within students that encourages them to keep pace with a rapidly changing society and realize education is a life long process.

Recommendations

Ridge

Currently the Industrial Arts/Technology Education Department is 3/5 under staffed and rooms are over utilized. Both rooms are used every period of the day. Another classroom is needed to absorb the current overload and meet future demands. Such a classroom could be a multipurpose room for Mechanical Drawing, CAD, Robotics, and Architectural Rendering. A room for this purpose could be set up with computers around the outside of the room and multipurpose tables in the center.

Additional courses could be added to the high school curriculum. William Annin currently offers courses in Technology Education and in Technical Theater, which receive widespread student interest. These courses are not offered at the high school. Students also participate in related after school activities at this level. It is recommended that options be considered at the Ridge to continue/complement this curriculum. The benefits of this would be to encourage more female students to take courses and benefit from the opportunities of Industrial Arts/Technology Education Department. It would satisfy the State Cross-Content Workplace Readiness Standards requirements, enhance student background for college preparation, and augment principles being taught in math and science classes.

A high priority should be to upgrade the software for CAD and Robotics. New computers are needed and additional robotic arms. Additional space and personnel for Robotics is needed.

In the woodshop, an air-filtering device (or two) should be installed to clean the air and alleviate the problem of sawdust in the air.

The Television Studio needs to be remodeled, including the purchase of additional equipment to accommodate new technology. Outdated and worn equipment needs to be replaced, but with equipment which will facilitate non-linear editing.

William Annin Middle School

Consideration should be given to the addition of a 6th grade Technology Education cycle. The current 7th grade cycle course could be taught on the 6th grade level, requiring the 7th and 8th grade course curricula to be reviewed.

In the technical arts shop, machine repair and service by a qualified technician is recommended. Presently, the band saw and both lathes are in need of service. As these machines are expensive to replace, repair is an economical solution.

In room 106, it is recommended that extensive cleanup and reorganization take place. The layout of the room may be restructured, a marker board and presentation area be installed, and machines and/or cabinets and supplies no longer in use be removed.

Appendix

Data Collection

Technology Education / Industrial Arts Comparison of I Factor School Curricula

Westfield	Berkeley Heights	Mendham W. Morris	Chatham	Holmdel	Livingston	Summit	Bernards Township
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Middle School

6 th Grade Tech. Educa.		Cycle				Cycle	
7 th Grade Tech. Educa.		Cycle		Cycle	Semester	Cycle	Cycle
8 th Grade Tech. Educa.		Cycle		Cycle	Semester	Semester	Semester
6 th Tech. Drawing	Marking pd.						
Manufacturing	Marking pd.						
8 th Metals	Marking pd.						
Graphics	Semester						
6 th Woods	Semester			Cycle			
7 th Woods							Cycle
8 th Woods	Semester						Semester
7 th Technical Fabrications							Cycle

8th Technical Theatre								Semester
8 th Robotics								Semester
8th Small Engines	Semester							

High School

Applied Tech. / Tech. Ed. I						Semester		
Tech. Ed. (Transportation)		Semester				Semester		
Tech Ed. (Metals)			Year		1 or 2 sem.			
Tech. Ed. II			Year					
Mechanical Drawing					Year	Year		
Mech. Drawing / CAD I		1 or 2 sem.	Year					Year
CAD I		Semester	Year			Year	year	
CAD II & III (Mechanical)						1 or 2 sem.	year	1 or 2 sem.
CAD II & III (Architectural)						1 or 2 sem.	year	1 or 2 sem.
Industrial Design								Year
Industrial Robotics I								Semester
Industrial Robotics II								Semester
Woods I	Year	1 or 2 sem.				Year		Year
Woods II	Year					Year		Year
Woods III								Year
Woods IV / Adv./ Ind. Study	Year							Year
Auto/Home Maintenance			Year			Semester		
Auto I						Semester		

Auto II						Semester		
Auto Adv.							Semester	
Electronics I		1 or 2 sem.				Semester		
Electronics II						Year		
Electronics III						Year		
Electronics for AP Physics						Year		
Graphics Tech.					Semester	Year		
Photography I		1 or 2 sem.				Year		Year
Photo II						Year		Year
Fashion I						1 or 2 sem.		
Fashion II						Semester		
Interior Decorating						Semester		
Television Production I	Semester					Semester	Semester	Semester
Television Production II	Year					Semester	Semester	Semester

**Student Survey-Industrial Arts/Technology Education
William Annin Middle School**

Directions: Using the Scantron Card, fill in the answers that best describe how you feel about the statements. Use the answers below to best describe your feelings.

A. Strongly Agree B. Agree C. Neutral D. Disagree E. Strongly Disagree

1. Industrial Arts/Technology Education courses at William Annin challenge my intellectual curiosity.
2. Industrial Arts/Technology Education classes help to prepare me to become a more informed citizen.
3. The course requirements are consistent with what is expected.
4. The Industrial Arts/Technology Education courses offered at William Annin will help me perform more successfully both in the work place and college.
5. Many of the Industrial Arts/Technology Education courses seem to cover the same content.
6. Homework and project work were more demanding than had been expected in Industrial Arts/Technology Education classes.
7. Industrial Arts/Technology Education classes help me to become more technologically aware and proficient.
8. There is a need for more Industrial Arts/Technology Education electives to be offered at William Annin.
9. Connections are made between Industrial Arts/Technology Education and other disciplines in a meaningful manner.
10. Current events are integrated into the classroom when appropriate.
11. Through the Industrial Arts/Technology Education courses at William Annin my writing abilities are being enhanced.
12. The Industrial Arts/Technology Education courses at William Annin are helping to prepare me to work in cooperative settings.
- 13. Overall, how would you rate your Industrial Arts/Technology Education experience at William Annin thus far?**

A. Excellent B. Above Average C. Average D. Below Average E. Poor

Student Survey-Industrial Arts/Technology Education at Ridge

Directions: Using the Scantron Card, fill in the answers that best describe how you feel about the statements. Use the answers below to best describe your feelings.

A. Strongly Agree B. Agree C. Neutral D. Disagree E. Strongly Agree

14. Industrial Arts/Technology Education courses at Ridge challenge my intellectual curiosity.
15. Industrial Arts/Technology Education classes help to prepare me to become a more informed citizen.
16. The course requirements are consistent with what is expected.
17. The Industrial Arts/Technology Education courses offered at Ridge will help me perform more successfully both in the work place and college.
18. Many of the Industrial Arts/Technology Education courses seem to cover the same content.
19. Homework and project work were more demanding than had been expected in Industrial Arts/Technology Education classes.
20. Industrial Arts/Technology Education classes help me to become more technologically aware and proficient.
21. There is a need for more Industrial Arts/Technology Education electives to be offered at Ridge High School
22. Connections are made between Industrial Arts/Technology Education and other disciplines in a meaningful manner.
23. Current events are integrated into the classroom when appropriate
24. Through the Industrial Arts/Technology Education courses at Ridge High School my writing abilities are being enhanced.
25. The Industrial Arts/Technology Education courses at Ridge are helping to prepare me to work in cooperative settings.
26. Overall, how would you rate your Industrial Arts/Technology Education experience at Ridge thus far?

A. Excellent B. Above Average C. Average D. Below Average E. Poor

Resources

New Jersey Cross-Content Workplace Readiness Standards

New Jersey Technology Goals

Technology Education Association of New Jersey

National Coalition for Technology in Education

Journal of Technology Education